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An Address
ON
METABOLIC FACTORS IN THE TREATMENT OF TUBERCULOSIS*

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THERE is probably no disease in which the so-called natural or physical—or one might say Hippocratic—methods of treatment have been so widely and successfully employed as in tuberculosis. They may be summarized as open air, sunshine, wholesome food, rest and exercise, and the accessory factor of altitude is considered by some of importance. The question naturally arises as to how and why these physical agents exert their presumed or believed influence. When we come to analyze their various effects upon the animal organism we find what appear to be certain contradictions and paradoxes. It is with the operation of these factors and their intricate correlation that I wish to deal to-day. I think our purpose in the first instance would be best served if we reviewed briefly what we know from experimentation is the physiological action of each of them.

When one is rash enough to incorporate in a title the word "metabolism" or any of its modifications or synonyms one is courting not only possible but probable disasters in a philosophical discussion of any biological question. Until recently metabolic studies in medicine have been confined to a consideration of the results of the general metabolism as determined by the respiratory exchange and the urinary nitrogen. By these means we have tried to assess the value of various agents which may, and probably, have a local cellular influence. We have attempted at times to draw particular conclusions from what may reasonably be termed a general or conglomerate result. It is undoubtedly true that at present our knowledge in regard to cellular metabolism is limited in comparison to the gross determinations. But we are slowly accumulating information concerning a number of agencies which seem to exert their influence upon local organs or tissues. It is important that we try to extend this exploration in health and disease.

It will be my purpose to review what knowledge we have of these physical methods of treatment in tuberculosis in so far as their effect on the body metabolism is concerned. It would be well in the first instance to determine whether the metabolic functions in tuberculous patients are different from normal. I think it may be safely stated that there is essentially no difference in the general metabolism in afebrile cases as compared with normal persons. In patients having a febrile reaction there is an increase of the general metabolism in proportion to the degree of fever, which increase closely follows von Hoff's law as to the increase of metabolism in proportion to the increase of temperature at which such processes are carried on. This, however, raises the question as to whether the temperature of the skin or the available mucous membranes is a true criterion of the tempera-

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ture at which the cellular activity is proceeding. We know from actual experiment that the cellular heat production in physical exercise is not in direct proportion to the general body temperature as generally determined. If this be so, the question which naturally comes to our minds is why certain cases of tuberculosis have a pronounced general febrile reaction with a comparatively localized lesion, while other cases with a much more extensive lesion exhibit no such general phenomena. The answer that there is a difference in the anatomical character of the lesions leads us nowhere. The fundamental difference is not found in such platitudes. There must be essential changes in the cellular phenomena and particularly in the cellular metabolic processes which probably lie at the basis of both local and general susceptibility and resistance to parasitic or infective diseases.

Atmospheric movement.—The extensive work of Leonard Hill and his associates in the investigation of the physiological influence of fresh air upon the animal body is the starting point in accurate knowledge of this subject. It has been definitely demonstrated that in any ordinary room the decrease in the supply of oxygen and the accumulation of carbon dioxide is never sufficient to have any deleterious effect upon the respiratory or bodily functions. In fact, in any room except one almost hermetically sealed, the changes in these gases are not sufficient to be detected by ordinary analytical methods. Nor is there any proof that there are any deleterious or poisonous substances exhaled from the lungs apart from pathogenic organisms sprayed out with the expired air on coughing. The latter of course are only expelled under specific conditions. The harmful and incapacitating effects of confined spaces are to be found in the increase of humidity, and the decrease of cooling power, which are intimately associated one with the other.

Rubner[1] was the first to show that there was an increase in the resting metabolism when an individual was exposed to a lowered temperature even when shivering was not induced. Loewy,[2] Johansson,[3] and Benedict,[4] however, came to the conclusion that such increased metabolism was mostly dependent on the degree of shivering. More recent experiments by Campbell, Hargood-Ash and Hill[5] would appear to confirm definitely the original work of Rubner. Hill and his co-workers took the degree of cooling power of the atmosphere as determined by the kata-thermometer. In addition to the increased metabolic rate there was a distinctly improved sense of well-being felt by those subjected to the experiments. The experiments were carried out in London, Mayor Treloar's Hospital at Alton, and Hayling Island, Hampshire. Under these different environments they had the opportunity of determining the relative effect upon the total metabolism of fresh air, heliotherapy and balneotherapy. Both children and adults were the subjects of the experiments and in general responded in the same manner. It would be impossible to go into all their findings in the present communication, but in brief they were as follows:

1. That the increase of body metabolism was roughly in proportion to the degree of cooling power of the moving air of their environment. That this increased metabolic rate was present before any shivering occurred and was quite independent of this muscular response.

2. That exposure to sunlight or heliotherapy did not produce any obvious modification of this effect and certainly did not seem to accentuate it.

3. Immersion in sea water at an average of 60° Fahrenheit for one-half to seven minutes would appear to promote a similar increase of metabolism.

In what manner this increased metabolism might influence the progress of the tuberculous lesion is not at all clear. In the more sturdy children and adults the muscle tone seemed to be increased and they appeared to improve so as to tolerate more prolonged exposure. On the other hand, it seemed quite definite that the more debilitated patients did not derive the same benefit,—in fact, it appeared to be contra-indicated in such.

Sunlight.—When we come to analyze the effects of sunlight we open up a realm of almost untold dimensions. The importance of sunlight to the animal and vegetable world in its evolution, and its recognition by past civilizations, make a most fascinating historical study. For centuries sunlight was worshipped by some as a deity. By others it was considered the source of all strength and fertility; while many races accepted its beneficence as a matter of course. But to none was it given to understand what sunlight really was nor to comprehend its methods

of action. To-day we may say that we are merely on the threshold of understanding physiologically what sunlight is. How it acts on the animal organism is still somewhat of a biological mystery. The small amount of experimental data which we have at present acquired makes us thirsty for more, and the future of bio-physics in medical science is one of almost untold limits.

It would serve no useful purpose at the moment to make a detailed exposition of light and radiation. The differentiation of the rays in accordance with their wave lengths, based upon the velocity and frequency of waves, is the foundation of our present knowledge of light and radiation. The wave lengths are estimated in what are termed Angstrom units which measure one ten-millionth of a cubic millimetere. The distance from crest to crest of the waves of different radiations is estimated as so many of these units.

My remarks to-day will be confined to a consideration of the effect of ultra-violet radiations the wave lengths of which range up to 3,900 units, the middle radiation 2,000 to 3,000 units and the near ultra-violet radiations from 3,000 to 3,900 units. It has been shown by Mason[9] that exposure to ultra-violet light reduces the oxygen consumption of the body. This is not a temporary effect but its influence is continued over many days. This effect is most pronounced in those persons who pigment easily,—being roughly in proportion to the degree of pigmentation,—and in those who have bile pigments or their derivatives in their circulating blood. I have stated advisedly that the oxygen consumption per minute is reduced in these persons. This does not mean that the total metabolism or heat production is necessarily reduced. It is possible to explain such a result by the hypothesis of the absorption of radiant energy through the skin.

The depth to which ultra-violet rays penetrate the epidermis has been a matter of some discussion. It has usually been conceded that they penetrate 0.1 mm.; and, on the other hand, that the majority is absorbed, comparatively little being reflected. Levy[6, 7] and Gassul[8] have shown that by exposing rats to ultra-violet radiations there is produced a pronounced congestion of the internal organs, especially in the liver, spleen, and lungs. If this be an effect of the ultra-violet rays it may be concluded that they are transported through the body by some vehicle. The discoveries of Finsen are of first importance in this matter. He demonstrated that the blood has apparently the capacity of absorbing these ultra-violet rays. In tissues filled with blood the penetration of the rays was comparatively slight; if on the contrary the skin were rendered comparatively anæmic by pressure between plates of quartz glass the rays penetrated much more readily. The evidence now available would all point to the fact that hæmoglobin and its derivatives have the capacity of absorbing and probably transporting radiant energy obtained by exposure to ultra-violet light.

How this absorbed energy may influence the body metabolism is not at the moment quite clear. There is evidence which might indicate that the different wave lengths may influence it differently. It has been suggested, and it is believed by some, that depending upon the wave length so may the metabolism be modified, the long wave length of ultra-violet increasing it, and the shorter wave lengths retarding it.

Another point to be considered in this regard is the question of sensitization to sunlight. Those who have had much experience with heliotherapy will no doubt have met with individuals who are very susceptible to such radiations. This sensitiveness may be either local or general, and may manifest itself in several different ways, but usually as follows. The local manifestations are urticaria, erythema and at times an excessive blistering, all of which are out of proportion to the degree of exposure to the ultra-violet rays. The general symptoms are those of vasomotor instability, syncope, and collapse. Indeed, these may be so distressing and the patients so sensitive that the least exposure to sunlight, either direct or reflected, may bring about loss of consciousness and in such cases renders the individual almost house-bound for certain periods of the year. The wearing of white clothing of thin texture in the summer time becomes impossible, and they are compelled to protect themselves by dark hues, sometimes even black, the hands and the neck being covered and the face shaded by a large dark coloured hat or parasol. The manner in which this sensitization operates is not understood, but it would seem to result from a general action. All of the features of the condition closely re-

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semble those of a local and general vasomotor disturbance.

On considering the treatment of disease, one must sound a caution as to the initiation of the use of ultra-violet rays. Many disasters have occurred from its too energetic use at first. It is common knowledge that those cases which do best are those that pigment most readily. It has also been found that these cases also show the greatest reduction in oxygen consumption. There is no evidence to indicate that the pigmentation prevents absorption, but if anything that it increases it. The pigmentation would appear to be a form of biological adaptation not developed to do harm but to enhance the benefit. That the reduction of oxygen consumption, with its parallel decrease of pulmonary ventilation, might be of some value in pulmonary tuberculosis through diminishing the demand for respiratory function, must be considered; but, on the other hand, the beneficial effects of ultra-violet radiation seem to come from a general phenomenon which affects the body as a whole. Not only is visceral tuberculosis benefited in many cases, but also,—and probably to a greater extent,—cases where tuberculosis affects the skin, subcutaneous tissue, bones and glands. The original conception of Finsen that this effect in tuberculosis of the skin was due to the direct action of light on the submerged tubercle bacilli we now know to be quite erroneous. How it acts is still open to investigation. There are two hypotheses that may be advanced; one, that the absorption and distribution through the body of relatively important amounts of radiation has a stimulating effect on local cellular activity. On the other hand, it is suggested that it may be the direct influence of the absorbed energy acting in some way as a substitute for the ordinary oxidation processes of the body.

Food.—This is another important factor which has loomed large in the treatment of tuberculosis. For many years excessive feeding was advised without any real understanding of the needs of the tuberculous patient. Consequently in time considerable difference of opinion was expressed as to the proper diet for such cases. In 1919 McCann[10] undertook an investigation of this problem. He found that in cases of tuberculosis without fever the metabolic requirements were the same as in normal individuals; but, if fever were present, the metabolism increased according to van Hoff's law as mentioned above. They also investigated the influence of diet upon pulmonary function. They proceeded on the premises that one of the essentials for all metabolic processes is obtained through respiration, namely oxygen, and that a maximum of pulmonary rest seemed to be an essential in dealing with inflammatory conditions of the lungs. They determined as controls the variations in pulmonary ventilation which occurred in pulmonary tuberculous lesions of varying extent. They found that the greater the amount of lung involved, the greater was the pulmonary ventilation per minute. This was also demonstrated by Dautrebande[11] and others. This increase would seem to be consequent upon the increased oxygen requirements resulting from fever and the muscular efforts of coughing and dyspnœa; while the reduction in the vital capacity and available lung tissue would render it necessary to increase the pulmonary ventilation in proportion to the reductions.

McCann then investigated the effect of different foodstuffs on the total ventilation, not only in regard to their specific dynamic action, but also in regard to the total ventilation independent of such an effect. After a meal rich in protein they found that the heat production and pulmonary ventilation were both increased in parallel as in normals. A meal rich in fat produced a comparatively small but parallel increase both in pulmonary ventilation and in heat production. On the other hand, after a meal rich in carbohydrate the increase of pulmonary ventilation was out of all proportion to the increase of heat production. This was believed to be due to the greater quantity of carbon dioxide produced from the metabolism of carbohydrate. These findings pointed out clearly that a diet rich in carbohydrate places a greater burden upon the pulmonary function in proportion to the heat production than does a meal containing large amounts of either protein or fat. On the other hand, the increase of metabolism consequent upon the increased specific dynamic action of protein would indicate that meals too rich in protein factors would lead to a wasteful increase of energy.

They then set about to determine the optimum balanced diet which would meet these theoretical considerations and came to the conclusion, taking the nitrogen needs of the body into con-

sideration, that 60 to 90 grams of protein a day was sufficient when the caloric value of the diet was about 2,500 calories, which would represent an increase of 1.7 times over the theoretical basal requirement. The rest of the caloric value was made up of fat and carbohydrate.

A number of studies had already been made on the effect of large diets on patients with pulmonary tuberculosis, and it had been found that patients on 3,400 calories did better than those on 5,000 calories, particularly when the protein intake was kept within moderate limits. There is now great doubt in the minds of many and strong opinions in the minds of some against the value of forced feeding in tuberculosis.

I have already mentioned the question of the specific dynamic action of foodstuffs and its effect on general metabolism. This I think should be more frequently considered and investigated in all cases where an increased diet plays an important rôle in therapy. It is a comparatively frequent experience to find individuals who become readily obese, while there are others whom it seems impossible to fatten. In fact, the more some eat the thinner they get, and it is often found that the individual with the largest appetite has not the largest bulk. Probably one of the important factors in these paradoxes is to be found in the specific dynamic action of foodstuffs. It was shown by Rubner[12] and Lusk[13] that the total resting metabolism increased, after a meal rich in protein, about 25 per cent to 30 per cent; after carbohydrate about 15 per cent, and after fat, only 4 per cent to 6 per cent. Work carried out in this clinic[14] has shown that these ratios are not constant and that in a number of individuals who are habitually thin, even to emaciation, there may be a great increase in the specific dynamic action of fat and carbohydrate. In fact, the ratio of the specific dynamic increase between protein, carbohydrate and fat may be inverted. As a consequence, the more fat they take, the thinner they may become, and similarly with carbohydrate. In obese people the specific dynamic action may be practically absent for all foodstuffs, and the results of increasing it would seem to have an important action in reducing the weight. It would appear evident from these observations that there is more in the giving of a diet in tuberculosis and other emaciating diseases than merely the quantity.

It has been claimed by many that high altitudes are beneficial for pulmonary infectious diseases. All the experimental evidence would strongly point to the contrary in so far as altitude or reduced barometric pressure *per se* is concerned. When an altitude is reached at which the reduction in the partial pressure of oxygen reaches a point where there is interference with the proper oxygenation of the blood, acute infections,—and particularly those of the lungs,—acquire a much greater mortality. This point is reached about 9,000 to 10,000 feet above sea level. Beyond this the effects of lowered barometric pressure become progressively more virulent. Below this point the combined effects of increased cooling power and intensity of sunlight may have such an enhanced effect as to more than balance the deleterious action of incipient anoxæmia.

The influence of artificial pneumothorax as practised in the treatment of tuberculosis is a subject of great physiological interest. A number of interesting studies have been carried out on this subject and they all would point by different paths to the following conclusions: (1) An increase of the oxygen saturation of the arterial blood with (2) a decrease in the carbon dioxide content, and (3) an increase in the hæmoglobin per cent. These changes occur in addition to the local improvement in the lung tissue itself, and may probably account for it to some extent.

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An Address

(*In Abstract*)

ON

THE FUNCTIONS OF A WOMAN'S CLINIC

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DR. WILLIAMS, in opening his address congratulated the university professor and his associates on the fulfilment of their dreams for ideal surroundings, and McGill University and the Royal Victoria Hospital on the imposing building so admirably devised for carrying on the purposes of its foundation. Before attempting, however, any discussion of the subject which had been assigned to him, the lecturer stated that he desired to emphasize the importance in his opinion of the connection of a clinic such as this with a university, for therein lies an important factor in its usefulness.

A university woman's clinic is to be defined as an adequately equipped hospital, limited to the care of suffering women, and staffed by highly trained physicians with university ideals; a clinic also where medical students are trained in the normal and abnormal functions of the female reproductive system.

The care of women during childbirth was first attempted in Paris during the reign of St. Louis in the XIII century. During the reign of Francis I, at the Hotel Dieu the *salle des accouchées* was a cellar-like structure, where the patients slept four in a bed. Under such circumstances puerperal infection was a constant scourge, and the only improvement effected before the time of the revolution was to limit the number of patients to two in each bed, and to attempt to separate them by a plank down its centre. During the revolution the *Maternité* was moved to the Abbe Port Royal where it still remains. This maternity was rendered famous by Madame Lachapelle, by Jean Louis Baudelocque, and particularly by the work of Tarnier, who eventually demonstrated that patients could be as safely delivered there as in their own homes. During these years, although the maternity was served in an advisory capacity by many eminent men, it was directed as a school only for midwives by a succession of *Maitresses sage-femmes;* to medical students it was rigorously closed. Not till 1745 was any instruction in obstetrics available for male students. At that date, the University of Paris authorized a theoretical course, but not till a hundred years later was any practical instruction given.

A similar condition of things existed in London, and the instructive lectures of William Hunter, and of Smellie were not delivered in the hospitals or medical schools of London, but were private enterprises conducted without supervision in their own premises. Johann Jacob Fried, who had been appointed head of the Maternity of Strasbourg was the first teacher in Europe to persuade those in authority to permit its utilization for the training of medical students, and under his supervision the men working with him were stimulated to extend the bounds of obstetrical knowledge; so it may be truthfully said that it was he who about 1730 organized the first woman's clinic in the world. His school was afterwards described as the mother school of all institutes of the kind in Germany. In 1751 one of Fried's most promising pupils, J. G. Roederer, organized the clinic of Göttingen, and during his short life made important contributions to the subject of obstetrics and thus rendered his school famous. Following the establishment of this clinic, professorships, and at a later date clinics were gradually organized in all the German and Austrian universities, although many of them did not attain prominence until after the Franco-Prussian war. From that date onward every German university had its Frauenklinik in which obstetrics and gynæcology were taught and practised by a single chief. Most of them were equipped with adequate laboratories for scientific work, and with a few notable exceptions

* Delivered at the opening of the New Building of the Montreal Maternity.

the chiefs were chosen, not merely because they were good clinicians and teachers, but because they had made more or less important scientific contributions to their branch of medicine. Thus at the close of the last century the idea of a university women's clinic had not only originated in Germany but at that date had its highest development in that country.

In France, unfortunately, obstetrics and gynæcology became separated, and while excellent obstetrical hospitals developed in the larger cities, they were poorly equipped from a scientific point of view. They trained many excellent clinicians, but failed to add materially to our stock of knowledge. Gynæcology became connected with surgery with the result that its scientific aspects were neglected. Gynæcologists suffered from their lack of knowledge of obstetrics, and obstetricians from their lack of sound surgical training.

At the end of last century, Great Britain did not possess a single institution which could compare favourably with the best German Frauenkliniks before the war. For that reason high praise is due to our colleagues in Edinburgh, who in spite of the lack of adequate clinical facilities and material resources, succeeded in maintaining their tradition for good productive work.

For similar reasons, the lecturer made no allusion to conditions in the United States, and it must suffice to state that it is only within the past few years that adequate university women's clinics have been established. At present, we are not as well off as was Germany fifty years ago. There can be little wonder, therefore, that our students are poorly trained, and that in the richest country in the world the puerperal death rate is higher than in any civilized country except in Mexico and in some South American States.

What are the functions of a University Woman's Clinic? All will agree that it is threefold; namely, the best possible care of patients, the adequate training of students, and the fostering of research.

No argument is needed to impress the fact that the first function of a woman's clinic is the best possible care of the patients entrusted to it. An enlightened treatment of the sick is rightly regarded as a fundamental obligation to the community, and in an institution such as this, to the donors also who have so generously made possible its erection. Moreover, the tradition long since established at the Royal Victoria Hospital makes any other course unthinkable.

Again, in such a university clinic as this it depends to some extent upon one's point of view, whether the teaching of students or the fostering of research is to be regarded as the more important function. The former, he thought, if properly carried out is a potent stimulus to the latter. In this institution conditions are ideal for good teaching, for the relationship between the hospital and university is such as to ensure that the headship of the clinic will always be in competent hands. The professor of obstetrics and gynæcology in the Medical College of McGill University will always *ipso facto* be the chief of clinics in this maternity building.

A competent professor will always be wise in the selection of his associates, and here we were fortunate in being able to teach obstetrics and gynæcology together, for in addition to uniting these two subjects into a comprehensive whole, it makes possible the elimination of much reduplication of effort, and enables the student to regard the various functions of the female generative tract in their proper perspective, and to realize that the more the function of child bearing is supervised, the less will the functions of other organs become deranged. Consequently, no matter whether the future practitioner limits his work to obstetrics, or gynæcology, or practises both branches, he will have a sounder foundation upon which to build than had he been taught each subject independently, no matter how brilliant his individual teachers may have been.

In passing to the consideration of who shall be taught in the clinic, the requirements of three types of students must be borne in mind; namely, the medical student on his way toward the degree of Doctor of Medicine; the graduate who after his interne service, desires to prepare for special practice or to fit himself for a career of teaching or research; and the practitioner who wishes to spend a few weeks in making good deficiencies in his original education.

In Professor Williams' opinion, it is the duty and privilege of the university clinic to foster the interest of the first two groups. Naturally, one sympathizes with the desire of the post-graduate practitioner for improvement, but it would seem inadvisable to allow the university staff to dissipate its energies in rudimentary instruction for those, who experience teaches will profit little from it. Such post-graduate students should be referred to specially devised schools which afford the type of instruction adapted to their needs.

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On the other hand, the training of regular medical students must be regarded as one of the important functions of the university clinic, and it is in great part from such students that the successive house staffs must be recruited. For such students the numerous ward-beds will furnish adequate material for necessary clinical instruction, unless such classes are allowed to become too large and unwieldly. Furthermore, it is important for the educational usefulness of such a clinic that adequate opportunities be afforded to graduates who desire to spend several additional years in preparation for their life's work. A proportion of these can best be trained by appointment to a long term house service in which routine clinical duties will not occupy their entire time, but will permit several hours of each day to be available for such investigative work as they are able to undertake. Moreover, after the completion of the first year of service certain minor teaching duties may be assigned to them, which as their ability becomes demonstrated, should be increased in amount and in importance. Graduate students for whom posts such as the above can not be found constitute a more difficult problem. In general, they should not be admitted unless they give promise of doing creditable work, and never for a shorter period of study than one year. To such students as are able and willing definite problems should be assigned for the solution of which each individual or each group should be held responsible. Those who come with a problem to solve already in mind are doubly fortunate; but for those who have no problem at the outset, one must be selected, and for that purpose the suggestions of the younger members of the staff are frequently invaluable.

In passing, a few remarks may be made concerning the qualifications of teachers, as it was his conviction that universities frequently sin grievously in the constitution of their teaching staffs, especially of the clinical departments, by allowing them to become clogged with practitioners, who have outlived their university usefulness. For this reason, the appointments to all posts below that of the chief should be for a stated period, and only those who remain actively engaged in productive work should be eligible for re-appointment. Nothing so benumbs a clinical department as the prolonged presence upon its staff of men, who have become so engrossed in their outside obligations, that they are unable to find time for investigation of any sort. Such not only exert a pernicious influence upon others, but check proper promotion by occupying posts which should be filled only by those anxious to advance the bounds of knowledge.

The fostering of research may in the present state of medical education on this continent be regarded as one of the most important university functions of a woman's clinic. It is not generally recognized that one can scarcely be an inspiring teacher, unless he is seriously interested in the fundamental bases of his specialty, and unless he is able to speak with that authority which comes only from first hand knowledge. Teachers of this type, however, are not common, and when found are difficult to satisfy, as they are rarely content with their allotted amount of clinical material and the few class rooms at their disposal. Such demand well equipped laboratories, scientific associates, trained technicians, and a reasonable budget.

The maintenance of the research end of an efficient clinic requires considerable endowment. Speaking generally, medical research has to be carried on along clinical or fundamental lines. In many instances the two are advantageously combined. By the former, are to be understood such advances as may result from the critical analysis of large series of accurate clinical observations, from the development of special skill in the study of certain phenomena of disease, or from the devising of new operative or technical procedures. Such contributions are highly important, and will doubtless continue to be made, but it is becoming increasingly difficult to make important discoveries by the unaided use of the five senses and the scalpel. The layman can scarcely appreciate the extent to which the fundamental sciences have become ancillary to medicine, so that within a short time after any new important discovery is made in pure science, it is promptly utilized in clinical investigation.

A relatively moderate scientific equipment for an ideal university woman's clinic should consist in small laboratories for biochemical, physiological, bacteriological and pathological research, and at the head of each a man who has spent years after completing his clinical education in perfecting himself in some science. In a woman's clinic it is essential that men responsible for such sub-divisions should be competent clinicians and surgeons, but their practical and investigative work is generally so engrossing that they are unable to engage in outside private practice. As a result they should be paid salaries sufficient to enable them to marry and perhaps support a

small family in moderate comfort. It was in his opinion undesirable to place too many of the clinical staff upon a full-time basis as there are many advantages which will always accrue to a clinic from its connection with a number of men who are engaged in private practice. What he desires, however, to emphasize is that work in fundamental investigation can only be expected from scientifically trained men, who are prepared to devote all their time to such work, and to make the heavy financial sacrifices incident to such a career.

We frequently hear it said by practical medical men that gynæcology is a dying specialty, and that obstetrics has been dead for years. Doubtless this is correct if one has only operative procedures in mind, but if we approach the question from a scientific point of view there is no field of medicine in which so many important truths await discovery.

The lecturer enumerated many problems which were in urgent need of solution, and closed his address by again stating that he regarded as one of the most important functions of any woman's clinic was the affording opportunities to scientifically trained men, who are anxious and willing to devote their days to the elucidation of problems connected with maternity and the health of women.

An Address

ON

PAIN IN THE LOWER ABDOMEN

By George E. Wilson, F.R.C.S. (Eng.)

I. Acute Causes

BEFORE we can appreciate the significance of abdominal pain whether of the acute or chronic type, it is essential that a thorough knowledge of its causation be kept in mind. In a hollow viscus with a nonstriped muscular wall either excessive contraction or excessive distension will produce in a normal individual a sensation of pain. Apparently all that is necessary is a uniform pressure on the nerves in the wall, and this is obtained in either contraction or distension. The fact that when under local anæsthesia we open the abdominal cavity, the intestinal tract may be pinched or crushed without pain, is no justification for concluding that the bowel is not sensitive. Indeed, one would be surprised if it were sensitive to such stimuli. Heat and light waves are very similar, yet the body generally is very sensitive to the former, and not at all to the latter. It would serve no useful purpose to have the body sensitive to light; a special type of cells in the retina looks after that, but it is very essential that heat be everywhere perceived, else burns would be very frequent; in other words the stimulus before it can be perceived must be adequate and appropriate. Nature never intended the intestinal tube to be pinched, the abdominal wall looks after that, and consequently pinching is not an effective stimulus. I realize that some would object to the statement that overdistension of a hollow viscus is a factor in hollow viscus pain, the contention being that such distension is immediately followed by contraction; but if pressure uniformly applied be the cause of the pain, then obviously it can be brought about by either contraction or distension.

While this is the sole cause of pain originating in a hollow viscus, it is not the only cause of intra-abdominal pain. Anything which causes abnormal traction upon a mesentery or mesocolon will produce pain, for the simple reason that somatic nerves in the posterior abdominal wall are being stimulated. Now these nerves, like those in the extra-peritoneal plexus of the anterior abdominal wall with which they are comparable, respond to direct pressure just as does any cutaneous nerve. In short, pressure is to a somatic nerve an adequate stimulus.

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The third factor in the production of pain originating in the abdominal cavity, is an inflamed peritoneum. From some focus, irritating material or bacteria have come in contact with the peritoneum, resulting in inflammation with its resultant exudate and pressure upon the somatic plexus of nerves. It follows therefore, that peritoneal pain is never spasmodic, but more or less constant. It is general or local, depending solely upon the area of peritoneum involved, and its intensity varies directly with the severity of the inflammation. The perception of the pain however, may be interfered with by various factors, such as the giving of a narcotic, or by toxins rendering the brain less sensitive in the later stages of the disease.

While a knowledge of the cause of pain is indispensable, the physical manifestation of pain, *viz.*, rigidity of the abdominal wall, is from the practical point of view of much more importance. In the main, there are two kinds of abdominal rigidity, which in some respects resemble each other closely, but in reality are very different. The first or voluntary rigidity is due to some lesion outside the peritoneal cavity, while the second or involuntary rigidity is caused by some pathological condition within the peritoneal cavity. In each, the abdominal muscles are held taut, but if the rigidity is of the voluntary type, there will be a slight relaxation just at the beginning of inspiration, while in the involuntary type there is no such relaxation at any phase of the respiratory movement. Again when the fingers dip in during the inspiratory relaxation in the voluntary type, the additional pressure does not produce an exacerbation of the pain, while if the same procedure is attempted at the beginning of or during any phase of respiration in the involuntary type, the pain will be increased. The reason is not far to seek since involuntary rigidity means one thing and one thing only, namely, an inflamed parietal peritoneum subjacent to the rigid muscles, and the rigidity is directly proportional to the inflammation. In this connection it is important to differentiate real rigidity from the "resistance" which the abdominal wall frequently presents to the palpating hand in a variety of conditions. For example, in extra-uterine rupture where a quantity of blood is suddenly projected into the abdominal cavity there is no true rigidity, because blood is only mildly irritating to the parietal peritoneum; there is, however, a resistance to palpation. A ruptured ovarian cyst is another similar example where the fluid is only slightly irritating to the peritoneum.

In considering acute lesions in the lower abdomen, we have to deal with two main varieties. There are those in which the causal factor comes from without, and those in which the disease originates from within.

Of the former, there are three types of injury, blows on the abdomen, stabs and gun shot wounds. A blow upon the abdomen, particularly when unexpected, so that the muscles have not had sufficient time to contract, may, apart from other minor lesions, cause a rupture of the bowel. In such an instance the extremely irritating contents are suddenly shot into the peritoneal cavity, just as though there was an explosion within the lumen of the bowel. Such an injury gives rise to immediate severe abdominal pain with well marked involuntary rigidity. If seen early, the temperature will be subnormal, the facies anxious, and there may be vomiting. The pulse is usually under ninety. Respiration will be thoracic in type and there will be probably no external signs of trauma or those of a trivial character only.

In the case of a stab wound which likewise penetrates the bowel, the picture is likely to be an entirely different one, provided there is not an associated injury to a large blood vessel, in which case the symptoms of shock with a pale skin, fast pulse, sighing respiration, great thirst, restlessness, and a falling blood pressure, will dominate the picture. Uncomplicated, a small stab wound of the intestine produces no well marked rigidity, for the simple reason that there has been no bursting from within the lumen, and therefore very little bowel content escapes immediately. Consequently, there are no marked signs of any intra-peritoneal lesion, and a patient in this condition has frequently to be persuaded that anything serious has happened. There is one sign, however, which I believe is constant, and that is, the presence of an area of deep tenderness, which cannot be explained by the injury to the abdominal wall. When such a sign is present, there should be no hesitancy in diagnosing a perforated bowel.

When the intestinal injury is caused by a bullet, the clinical picture varies with the size

of the bullet, but the speed of the missile is the important factor. With high speed there is an explosive effect and therefore, much soiling of the peritoneum with rapidly developing rigidity; while in cases in which the velocity is not great there is slow penetration, and, in consequence, only a small amount of intestinal content escapes; so that for the first few hours there may be no other sign than the presence of abdominal resistance. Cases are not infrequent where there may be a dozen holes in the bowel, and yet the patient feels so well that it is with difficulty he is persuaded to have an operation. Needless to say, immediate operation should be performed in all abdominal wounds, unless it can be positively stated that on account of the direction of the wounding agent the abdominal cavity has not been penetrated.

When we consider the second great class, or those arising from within the abdominal cavity, the first place must be given to acute appendicitis. *Appendicitis* occurs at all ages, but is most common between the ages of ten and thirty. Pain is the first symptom, and in the great majority of cases is first felt in the epigastrium, but the right iliac fossa may be the initial site. In any case in a few hours the most of the pain is referred to the cæcal area. It is more or less continuous, but may have a colicky character; nausea and vomiting may follow in rapid succession, but they are not usually prolonged. There is a rise in temperature and an acceleration of the pulse rate. It is unusual in the early stage for the temperature to be above 101° F., and the pulse in an adult is not likely to be over 90. Leucocytosis is usual, but anything over 20,000 is unusual. On physical examination the right lower quadrant will give evidence of deep tenderness due to the inflammation in the posterior abdominal wall in the immediate vicinity of the inflamed appendix. At the same time, there may be some reflex splinting of the anterior abdominal wall; but as soon as the inflammation has involved the anterior parietal peritoneum, involuntary rigidity develops, and will depend for its intensity upon the degree of inflammation beneath. While this brief description applies to the majority of cases, there are many variations from the extremely mild to the rare type termed fulminating appendicitis, in which the clinical picture resembles very closely that seen in a perforated duodenal ulcer with severe pain and prostration, board-like rigidity, subnormal temperature, shallow breathing and an anxious facial expression. Such cases are due to a distended appendix suddenly perforating into the free peritoneal cavity, or to an insidiously developing abscess which has burst and allowed the contents to be widely disseminated. In either case, extremely irritating material has come in contact with the parietal peritoneum; hence the board-like rigidity. The treatment is surgical irrespective of the stage of the disease, and should there be an abscess, the incision should always be made well to its outer side.

An *acute pleurisy,* a basal *pneumonia,* or *fractured ribs,* are sometimes responsible for acute lower abdominal pain, and not rarely has the abdomen been unnecessarily opened. There may be lower abdominal rigidity in such instances due to the irritation of the lower intercostal nerves, but it is of the voluntary type. In the early stage, nothing abnormal may be present on auscultation, but some impairment of the respiratory movements may be noted. The initial chill so common in pneumonia is very exceptional in appendicitis. The temperature will likely be high, ranging from 103° F. upwards, which is unusual in appendicitis. Excessive movements of the *alæ nasi* are strongly suggestive of some pulmonary condition, and there is very frequently a catching of the breath, or an expiratory grunt.

Rupture of the gall bladder into the general peritoneal cavity is an extremely rare condition, and when it occurs, resembles in many respects a severe appendiceal attack, in that the contents of the gall bladder find their way early to the right iliac fossa, being directed thither by the great omentum and the gutter lateral to the ascending colon. The main reliance in arriving at a correct diagnosis must be placed upon an accurate history, aided by careful blood and urine examinations.

Similarly, a *perforated duodenal ulcer,* and, occasionally, a *gastric ulcer* may be mistaken for acute appendicitis for the same reason as a ruptured gall bladder, and there are undoubted cases where more pain is felt in the right lower quadrant than in the epigastrium. There are few diseases in which a diagnosis can be made more easily from the history alone, than in that of perforated duodenal ulcer in the vast majority

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of instances. Suddenly like a bolt from the blue, the patient is seized with very severe pain in the abdomen, either in the epigastrium or lower down, which doubles him up and makes him look for a place to rest. He breaks out in profuse perspiration; about 25 per cent of such cases will vomit, and when seen a few hours later, the upper abdomen at least is board-like; it hurts him to take a deep breath and there is some pallor in the face. His temperature will be subnormal, the pulse around 80, his systolic blood pressure well sustained, and there will be a moderate degree of leucocytosis. Absence of liver dullness is not common, and is not very important unless known not to have been present a short time previously. Similarly, dullness in the flanks is not of any great value in early cases, and it is remarkable how much fluid may be present in acute disease without any recognizable change in the flanks; usually there is a history of duodenal ulcer. Immediate operation should be performed, and if the opening be closed by mattress-sutures so placed that the suture line is parallel with the pyloric ring, and this covered by a free omental graft, there is rarely any necessity to do an immediate gastro-enterostomy.

Thrombosis of the mesenteric vessels is most commonly met with after the age of forty. The onset is with acute abdominal pain which is constant in character because of the drag upon the mesentery. Nausea and vomiting are pronounced and occasionally the vomitus contains blood. There is apt to be diarrhœa, and in about 40 per cent of these cases there is blood in the stools. In the early stage there is resistance to palpation, but no real rigidity. Operation is indicated, but in most cases the prognosis is extremely bad.

Acute intestinal obstruction including strangulated hernia accounts for a considerable percentage of abdominal emergencies. The causes are many but the early symptoms and signs are few, and in the order of their importance they are: constipation, pain and vomiting. To the patient the outstanding feature is the stoppage, and either an aperient or an enema will probably have been given; but while an enema may occasionally bring away a fair amount of fæcal matter, it will be found on enquiry that no flatus or very little was passed, and any relief obtained was of a temporary nature, and that the pain returned accompanied by vomiting. As to the character of the pain, it is always colicky, but with more or less persistence of the pain between the more severe spasms. The explanation of the colicky pain is of course the spasm of the bowel proximal to the obstruction, while the constant pain is due to irritation of the extra-peritoneal nerves from mesenteric pull in the case of obstruction by a band, and to involvement of the nerves about the sac in the case of a strangulated hernia. The vomitus at first contains only the contents of the stomach followed later by bile stained material. The abdomen will be soft except during a spasm, when it will be voluntarily held taut, and except in the rare case of volvulus of the sigmoid, there will be no distension. There will be little change in either the pulse or temperature, but a moderate leucocytosis occurs early. I realize that this picture of intestinal obstruction is markedly at variance with the text-book description in which a weak, rapid pulse, distension, shock and fæcal vomiting are described as outstanding features; but the sooner these signs are recognized as those of a dying man whose case has been neglected the better, for not until then will the high mortality of acute obstruction be materially lowered. If we compare the mortality of intestinal obstruction with that of strangulated hernia, we find the mortality in the latter very much lower; mainly for the reason that operation is performed early; the reason for the early operation is the presence of a lump which can be seen as well as felt. When the abdomen is opened for the same general signs and symptoms as would be found in an external hernia, then and then only will the mortality of internal obstruction be materially reduced.

Part II will appear in our next issue

An Address
ON
THE APPENDIX PROBLEM TO-DAY*

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IT is not the purpose of this article to discuss the appendix question in the light of recent investigation, but rather to emphasize what experience has contributed of value to our present knowledge of the subject. We are still frequently confronted by a grave emergency which demands serious consideration and it is principally to this phase as to-day's problem, that I wish to call attention.

During the past few years, apart from the usual manifestations, appendix pathology has been identified with gastric and duodenal ulcer, focal infection and as participating in an acute generalized infection of lymphoid tissue. These observations have resulted in a more intelligent interpretation of hitherto obscure symptoms. We have learned to appreciate the significance of abdominal pain and tenderness arising during or shortly after an acute tonsillar infection.

As far back as 1893, Kelynack remarked that appendicitis was often associated with tonsillitis. Yet the serious possibilities were never stressed until 1916, when Dr. H. B. Anderson pointed out the grave situation that might suddenly arise in such cases. To illustrate this relationship, the case of an orderly in one of our local hospitals is a striking example. After several days in bed with a severe attack of follicular tonsillitis, he was up and about again, giving a "hand" in a general way with the work of the institution. About eight o'clock in the evening he was seized with violent abdominal pain which rapidly became worse. Shortly after midnight he was taken to the operating-room, when the appendix was found already perforated, not five hours from the onset of pain. This of course is unusual but it shows that the first pain may come with perforation in these conditions. He is positive that he had no pain before this, beyond a little abdominal discomfort the previous day. No doubt an examination then would have revealed tenderness and probably rigidity in the right lower quadrant. The patient himself remarked that he thought his trouble came from the "sore-throat" in the first place. Appendicitis as a sequel of tonsillitis occurs much more frequently than one might suppose, unless special attention is given to this part of the history. Definite tenderness over McBurney's point is an indication for operation under such circumstances, provided no contra-indications exist. We should make it a practice to examine the abdomen carefully when at all suspicious.

This suggests a few thoughts on that condition looked upon by some as an abdominal expression of an influenzal infection. Last winter I removed seven perforated appendices from patients who, before being admitted to hospital, had been treated for "abdominal grippe." Here also it is reasonable to suppose, that the lymphoid tissue possesses a certain vulnerability to specific infection, as it does elsewhere. There may be such a disease as abdominal influenza, but it often turns out to be surgical. In these cases as well as in those where the tonsils are markedly involved, a treacherous appendix may be obscured by the constitutional reaction that attends these infections. It is scarcely necessary to add here, that the chest should be carefully and repeatedly gone over before anything surgical is definitely decided upon. Especially in the young, must we be very apprehensive of a lobar pneumonia with pain referred to the abdomen. No matter how familiar we may be with this fact, it is an easy matter to make a serious mistake, when the physical signs are late in appearing. I remember a child coming to the operating-room with

* Delivered before the graduating class, Queen's University, January 14, 1927.

his nostrils working vigorously, whose rapid respirations were the only suggestion of pulmonary involvement which appeared later.

Now in the type of appendicitis with which we are most familiar, there are a number of things which may be determining factors. Among these is the home treatment before competent medical advice is obtained. Very few cases of perforation succumb following operation who have not had a purgative before coming to hospital. Someone mentioned this years ago, and still the warning goes unheeded. It is a tragedy enacted over and over again in the experience of every surgeon. Our department of public health should warn people of the danger of giving epsom salts and castor oil in abdominal pain. They might suggest an enema which is much safer and twice as efficient. One questions if it ever causes perforation unless very late. It more frequently removes the necessity for operation.

Next in importance is the question of "early" and "late" operation. Early operation being less serious, does not occupy a prominent place in this article. The results are uniformly good. There is supreme satisfaction in "getting ahead" of a perforation, which rarely occurs under twenty-four hours. Very sick patients recover rapidly, if done while the inflammatory process is limited to the appendix.

Once perforation has occurred, what was practically sterile serum has become a culture medium for virulent organisms. The whole question has taken on a serious aspect. So much depends upon the interpretation of clinical findings, one hesitates to make a definite pronouncement, knowing the probable serious consequences. The old saying: "judgment is difficult and experience fallacious," was never more fitting than here. Probably the dictum to operate as soon as diagnosed, is applicable to the majority of cases but not to all. If the clinical picture be not one of acute, spreading septic peritonitis, the best reasoning favours immediate operation with suitable drainage.

We used to wonder why the case coming in days after perforation frequently did better than one of a few hours standing. Was it a natural or an acquired resistance, the strain of infection, or the phase in the cycle of events which decided the issue? From these observations grew principles which to-day are practically applied through improved technique. To assist nature one must intelligently interpret her designs. The appendix has done its worst; experience proclaims the folly of dealing the final blow. Hour after hour you nurse him along with no satisfactory information for anxious relatives, or yourself. Employing the best measures known to date, probably a favourable reaction takes place which will tide the patient over until nature makes an attempt at limiting the process. There is no hope without absolute control of peristalsis. If you get a circumscribed abscess by measures directed to this end, success is in sight. The general improvement which attends localization makes the patient a better surgical risk by far than when the case was admitted to hospital.

The following principle seems to be applicable in most instances. When a patient is very ill, especially a child, with very rapid pulse and where there is no question of perforation, if there be any tendency to localize the infection, it is good judgment to wait and observe carefully for a time. Warm the hands well, go over the abdomen carefully, the least suggestion of abscess formation will be a palpable reality in a few hours. Let the patient improve as long as he will, but if the condition warrant interference, do not wait for secondary rupture of the abscess into the general peritoneal cavity.

A large abscess, which can be made out by rectal and abdominal examination, should merely be punctured and let leak away slowly as nature would do, for fear of sudden and fatal collapse. I saw this happen with a strong boy who was getting in pretty fair condition after a week of critical illness. Patients rarely recover from collapse that follows sudden evacuation, because their powers of response have suffered too much damage from prolonged sepsis. When these abscess are allowed to drain slowly they usually do well. I have had very gratifying results with these cases. It requires great patience.

Drainage is the most important item in the surgical treatment of peritonitis. It is unfortunate that any surgeons should have fallen away from the old reliable teaching: "when in doubt drain." There is no super-toilet of the peritoneum good enough to make it safe to close without drainage, once actual contamination has occurred. Drain every case with perforation,

no matter how recent. To disregard this warning is to invite disaster. Drain every patient with a gangrenous appendix from which the serosa is slipping or sloughing off, perforation or no perforation. If you examine the bed from which it was separated, there is always a greyish necrotic patch, which conforms to the shape of the appendix, where it left its impress on contiguous structures. This necrotic tissue is vile and infested with organisms. Put in a drain or you will hear from it before a week. It frequently ends in pelvic abscess or other nuisance. Any departure from this wholesome doctrine is dangerous and unwarranted. It is not necessary to drain the case with a fulminating, slippery appendix, no matter how ill he may be, provided you are positive there is no "leak."

Still there are many with whom the question of drainage is quite unsettled. The only logical explanation is that drainage in their hands has been a failure, from lack of a proper understanding of its principles. For the sake of clearness, I should like the privilege of enlarging on a few details. To begin with, all that is necessary is a proper means of escape for purulent accumulations; if you like, call it a chimney through the abdominal wall. Nature temporarily puts the gut out of commission to prevent peristalsis from spreading the infection. Now when you make a defect in the wall with a knife, notice how the moderately distended coils arrange themselves and push the serum or pus through the opening, the point of least resistance. It is ever nature's principle to fence off, and get rid of undesirable matter. To disturb this arrangement with a long drainage tube, would defeat the purpose of nature, excite a plastic and fibrinous exudate from engorged vessels, produce adhesions, and possibly obstruction. A soft drain may be placed in the bottom of a well defined abscess cavity in the immediate vicinity of the opening. It is important therefore to have the incision directly over the abscess, if possible, Nature's only exception to this system of defence is the diarrhœa that sometimes occurs when the infection gets into the pelvis. The purpose may be to confine the pus to a place best suited to natural drainage. This feature is an expression of para-sympathetic response following a perversion of the normal nervous mechanism of the bowel, induced by toxins or stimuli at certain levels.

The stiff drainage tube has many objectionable features which render it unsuitable for use in the abdomen. It produces over-distension reflexly by irritating sensitive viscera with each act of respiration, pressure necrosis when the distended bowel tries to push the tube out, as it would, pus or serum. A fibrinous exudate may come to the rescue and prevent fæcal fistula before the eroded, necrotic intestinal wall gives away, but adhesions produced by such a process may give rise to serious trouble. Fæcal fistulæ in children frequently appear with very little mechanical erosion of the gut.

When an improper drain is used, there is a strong tendency to remove it in a day or two. Now this is the very thing one should not do under any circumstances. Pulling out drains before they are loose is responsible for secondary abscess formation, distension, vomiting and not infrequently, death. This has happened with patients who were doing well, before the surgeon started to meddle. Probing, pulling and the like are nearly as fatal as re-opening the abdomen. Use the right kind of a drain; put it in properly, and there will be no need for disturbing it until it makes a track for itself and is ready to slip out. If the hole closes after this, it will re-open itself until all undesirable matter is expelled. A soft drain does no harm if left in nine or ten days. Then, if there be any odour it may be exchanged for a strip of gauze soaked in hypertonic saline, carefully inserted. Gauze rarely becomes adherent at this stage.

A good drain may be made from a soft, flexible rubber tube, properly prepared, or from gutta-percha tissue. The rubber tube should be half an inch in diameter, with walls thin and very pliable. You will have remarked that tubes drain around them, rather than up through the lumen. To utilize this principle, start a little distance from the end with a pair of curved scissors cut spirally around making four or five turns, stopping a short distance from the other end, or you may cut from end to end. If the assistant takes hold of the other end, it may be untwisted while the edges are trimmed smoothly. This makes the tube still more pliable. Pull through the lumen by means of an artery clamp, a piece of gauze which fills the

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bore. Before you insert the drain, soak it in an hypertonic saline solution and place it dripping in the abdomen. The salt solution invites a flow in that direction, but what is more important, it prevents the sticky blood-serum from sealing up the drain and blocking drainage, as it often does for two or three days. This is why drains are tampered with or even removed, when there is nothing coming up. If advocates of the closed method say there is little to drain, they should expect little for a few days after a thorough cleansing. There may be but a slight discharge for a while, but what there is comes up from the first. It matters not if the wick in the centre become saturated as in other tubes, the pus continues to rise spirally around the gutter. In bad cases it is well to keep the drain moist by the application of saline compresses, occasionally. Guttapercha tissue twisted around a piece of gauze makes an admirable drain. While the assistant holds it, tie a catgut ligature around each end, to prevent untwisting. In any drainage case, protect the rest of the wound by applying over the sutures a dressing wet with compound tincture of benzoin.

Pulmonary embolism, pneumonia, and gastric dilatation, though of less frequent occurrence than formerly, may appear as post-operative complications in appendicitis, as well as in other surgical conditions of the abdomen. The salient features concerning these are enough for an article of this kind. It is not necessary here to discuss pulmonary embolism such as may occur during the course of an ordinary phlebitis, but rather that which makes a meteoric appearance post-operative in a case that was thought to be doing nicely. These cases originate from an unrecognized thrombo-phlebitis of some of the systemic group of veins encountered during operation. Tissue devitalized by crushing operations, mass-ligation, and rough manipulations is a fertile soil for infection. These infections may not be of sufficient virulence to assert themselves in the usual way, but through their peptonizing action may liberate emboli from well organized clot. Whatever the cause, sharp dissection and as little trauma as possible, together with thorough cleanliness, appear to be the best means of preventing such an accident.

The strongest premonitory symptom of pulmonary embolism is a slight rise of temperature which cannot by any means be accounted for, appearing after the fibrin-ferment temperature of operation has entirely subsided. When such a temperature occurs, there exists somewhere a thrombo-phlebitis, and the patient is a candidate for pulmonary embolism. I have seen very little of this dreaded complication, but from the best information to be had on the subject, it seems that it never occurs without this premonitory rise of temperature. About 85 per cent of all instances that happen in clean cases seems to take place between the sixth and ninth day post-operative. -It would seem good judgment to keep suspects quiet until after the twelfth day, after which it is rarely heard of except in cases known to be septic. Indeed few have been recorded after the tenth day in clean uncomplicated cases.

Just how far very minute emboli may be responsible for post-operative pneumonia and other pulmonary involvement, I am not prepared to say. Apart from a pre-existing lung condition, influenza, or infections of the upper respiratory tract, one should consider such a possibility, knowing that very small emboli are seldom immediately fatal.

Many theories have been advanced as probable causes of acute gastric dilatation, such as a sympathetic response to abnormal stimuli or toxins, or a corresponding depressed function of the vagi with upset of the nervous mechanism. The cause is still a mystery, although prolonged exposure of viscera, traction and much manipulation are looked upon as predisposing factors. The treatment is early and repeated gastric lavage with a weak solution of bicarbonate of soda. So long as gastric dilatation has not had four or five hours start, the outlook is good, success depends upon how early it is recognized.

In closing, I feel that it is not out of place to re-state a few old and familiar principles in the treatment of peritonitis, which time and experience have accepted. There is little hope for localizing the infection without controlling peristaltic movement. To this end everything must be withheld by mouth, and the stomach washed out when necessary. It is an unscientific and fatal practice to give cathartics after operation. I still adhere rigidly to my former principles in this respect.

Give abundance of fluids by proctoclysis or

other means, if the patient's state permit, until the infective process is limited. The benefits of hypodermoclysis are frequently offset by the shock it produces in patients weakened by sepsis. Intravenous administration is preferable to hypodermoclysis, if neatly done with a little novocaine to render the tissues insensible. Generally speaking the Murphy drip with all its variations works admirably. Dilution stands foremost as a means of overcoming the evil effects of dehydration, of rendering inert and of eliminating toxins, which by their concentration pervert and destroy vital function.

Tincture of digitalis in proper dosage for rectal administration has rightly become popular as a useful addition to the drip, in threatened intestinal paralysis or cardiac failure. A teaspoonful of adrenalin 1:1000 solution, with three ounces of whiskey, added to twenty ounces of soft water given by the drip method, is very useful in cyanosis, or cases of impending collapse, while waiting for digitalis to follow with its sustained effect. Bicarbonate of soda and glucose are of course the most reliable agents to date for the treatment of acidosis and the intractable vomiting that often attends it.

Aside from its use in intestinal paralysis, I have found pituitrin the most powerful and reliable stimulant in failing circulation. Its effects are better and more sustained than adrenalin. Unlike most other stimulants it seems to act as well every time it is used. It may be repeated at intervals of three or four hours and in doses of ½ to 1 c.c., according to age and need.

A most remarkable experience in this connection, was the case of a young man last April, who was admitted to hospital very ill with peritonitis. For reasons which were then apparent, I removed the appendix which was partially sloughed away, and drained the abdomen. There was no tendency to localize the infection. He went from bad to worse and the second morning was very cyanosed; at noon he showed indications of right heart failure, with rapidly advancing pulmonary œdema. We gave him atropin gr. 1:100, and 1 c.c. of pituitrin hypodermically. In a short time the pulse was markedly improved, and the cyanosis quite cleared. The pituitrin was repeated in three hours and again in four hours, this time with more atropin. There was no more atropin given after this, but the pituitrin was again administered in six hours, and a final dose eight hours later. The patient progressed nicely to a satisfactory recovery. This was the first time that I ever saw such a case recover. I had used atropin many times before. No doubt the atropin helped the œdema, and more air the cyanosis, but the effect of the pituitrin was immediate.

On previous occasions, I had noticed the remarkable effects of pituitrin in circulatory failure, much more so than its action on paralytic bowel, but never anything to equal the experience just related. I have never seen any benefit from strychnin or camphor in oil. Start early and try to sustain the circulation with coffee, digitalis and brandy, by proctoclysis, in extremity use pituitrin or adrenalin hypodermically. These measures together with the assistance of a good stomach-tube, have come to the rescue a great many times in the experience of most surgeons. As an additional note in regard to the stomach-tube, it is not used half enough in the treatment of peritonitis. Washing the stomach is an excellent practice, when it is loaded with lethal toxins regurgitated from the upper intestinal tract. Note the pulse improvement in these cases. By some peculiar mechanism that belongs to the intricacies of the nervous system, whenever you introduce a stomach-tube and dilate the cardiac orifice of the stomach, at the same time the ileo-cæcal sphincter relaxes. This also is of marked benefit to patients with a silent abdomen and marked distension. They often expel enough gas to relieve overdistension, and the intestine so relieved may recover some of its tone.

Without making any claims to originality, I have tried to give clearly that which seemed important and reliable in the accepted teachings on the subject, and to emphasize what personal experience has selected as useful.

In spite of all the advances in the sciences of physiology, biochemistry and surgery, appendicitis and its complications still claims many valuable citizens. During the last decade, science has achieved much in being able to convince the laity of the relative safety of early interference. Yet in examining our statistics, one often feels

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that if our mortality were not liberally "diluted" by early and interim successes, there might be less to show that would attest to real progress in the treatment of this malady.

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An Address

ON

FOCAL INFECTION IN RELATION TO SYSTEMIC DISEASE*

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THE knowledge of systemic disease due to local infection is as old as medicine. Long before the development of bacteriology there had been noted many examples of general disease arising from slight or serious accidental or surgical wounds. The general disease was as a rule characterized by chills, fever, and general debility, and was often fatal. The cause was thought to be contamination of the wound with some substance which caused putrefaction, consequently the disease was called septic. Many theories were brought forth as to the origin of these putrefaction agents. It was Semmelweiss in 1847 who discovered that the prevalence of child-bed fever in the Vienna Lying-in Hospital was due to the contamination of the genitals of the woman in labour by the unclean hands of students and physicians fresh from the dissecting rooms. Cadaveric poison, therefore, was proved to be a cause of child-bed sepsis. Local infection followed by embolism, thrombosis and septicæmia were then recognized as successive stages in surgical and obstetrical sepsis. But no material gain however in practical results occurred, until the deductions of Lister, based upon the brilliant researches of Pasteur proved that infection was due to bacteria, and the rational application by Lister of measures to prevent wound infection.

We have progressed far beyond the day when hospital gangrene was common in every ward, and when a large percentage of women in labour developed puerperal sepsis. There still remains, however, a vast amount of work to be done in the field of bacteriology. Little is known as yet about the micro-organisms of many of the diseases of man; further, there is a great deal to be discovered in regard to immunity and susceptibility. In the consideration of diseased conditions it is not alone necessary to inquire concerning the infecting agent, but it is also essential that we examine closely the state of the organism attacked by the disease. Pasteur never ceased to consider the creature invaded as well as the invader; he found that when a fowl stood with its feet in cold water for a time it became susceptible to the invasion of bacteria which formerly would not hurt it. We know that animals when greatly fatigued become more susceptible to infection, and it has been proven that rabbits inoculated with tubercle bacilli after having become actively tuberculous recover when given their liberty and allowed to run wild in their natural environment, while others which are kept in captivity succumb to the disease.

We often find that an individual develops a coryza or tonsillitis following a severe chilling on a cold, damp night. Knowing then that infection takes place more readily after the resistance is lowered, is it not useless to consider the toxicity of the infecting agent, and not at the same time inquire as to the susceptibility of the tissues of the organisms attacked? How can we hope that the human organism can resist or overcome infection, unless attention is given to nutrition? We know that the great majority of civilized mankind who are

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city dwellers carry a latent tuberculous focu in the apices of the lungs, in the mediastinal, or mesenteric glands, or elsewhere in the body. We are told that in almost 100 per cent of human beings who live in large cities there are found post-mortem evidences of tuberculous infection somewhere in the body. In a large percentage of cases these lesions are healed, however; in most cases this infection has existed since childhood awaiting the opportune time to flare up and give rise to clinical tuberculosis. How is it that so many are attacked by the tubercle bacillus and so few develop active clinical tuberculosis? It may be that those who escape are more fortunate in being able to maintain their nutrition in good condition while others for some reason allow their resistance to fall below the safety point, and to remain at a low level, sufficiently long for the tuberculous infection to gain the upper hand. All individuals do not possess an equal degree of natural immunity; some more readily succumb to the invading infectious agents. Pneumonia, rheumatic fever, tonsillitis, sinusitis, nephritis, septicæmia, and other infectious processes, have been recorded after exposure to extreme cold; here the latent pathogenic bacteria, which are usually present in the mouth and throat, because of added virulency, are able to invade the host whose resistance has been lowered.

Focal infection especially of the structures of the mouth and upper respiratory tract is a very prevalent condition. Many varieties of pathogenic micro-organisms are found in the mouth and upper air passages. All infectious foci of the head may be associated with secondary infection of the lymph nodes of the neck and mediastinum. Many children suffer from acute glandular fever due to anginal conditions; not infrequently the infectious micro-organisms appear to pass rapidly through the cervical lymph channels and glands, and result in severe bacteriæmia and fever. With a virulent type of micro-organism in children these glandular infections may become fatal. In older people, the filtration through the deeper cervical glands is said to be slower, consequently the virulence of the bacteria and the degree of bacteriæmia may be less.

The lymph node infection may disappear with the removal of the primary focus of infection, or may persist actively as a new focus in the production of systemic disease; or the infection in the nodes may become permanently latent.

The spread of infection from a chronic focus occurs in three ways, *viz.*: (1) by direct extension to adjacent tissues, (2) by extension along mucous or serous surfaces, and (3) by way of the blood stream or lymphatics. Invasion of the blood stream and the spread of the infective agent from a chronic focus occurs usually during periods when the resistance is lowered by such agents as fatigue, exposure, digestive disturbance, improper food, acute and chronic infections and overwork.

The system may gain an immunity against infection and be able under the usual conditions of life to keep it in check, but immediately the defences of the body are below par the infectious agents multiply rapidly, invade the blood stream, and are carried to distant structures or organs and there set up secondary infection.

Primary foci usually are located in tissues communicating with a mucous or cutaneous surface. Secondary foci are the direct result of infection from other foci through contiguous tissues or at a distance through the blood stream or through lymphatic channels. Infection of the teeth and jaws with the development of pyorrhœa and alveolar abscesses; infection of the faucial or nasopharyngeal tonsils, or of the mastoid and accessory sinuses are the most common forms of focal infection. Chronic infection of the bronchi, of the gastro-intestinal tract and auxiliary organs of digestion, chronic infection of the genito-urinary tract, endocervicitis, salpingitis, vesiculitis, prostatitis, cystitis, pyelitis, are not uncommon forms. Auto-infection and auto-intoxication from the intestinal tract have been given serious consideration. Stasis of the intestinal contents is thought to be an important factor in the causation of auto-infection. Intestinal stasis may be due to constipation, to partial obstruction of the intestines due to congenital defects, or to acquired morbid conditions, which favour the presence of pathogenic bacteria with putrefactive changes, resulting in toxæmia and systemic disease. While a variety of unhealthy conditions may arise from stasis of the intestinal contents, it is the opinion of many authorities on the subject that pathogenic micro-organisms in the intestinal canal which remain there as infectious organisms, gain en-

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trance chiefly by swallowing infectious material from the mouth, throat, nose and also through infected food especially milk, for milk often contains streptococci which are virulent or may become so.

Streptococcal infection from a focus may by passing through the blood stream cause appendicitis, cholecystitis, peptic ulcer, or pancreatitis. Dental infection is one of the commonest of the chronic active infections, and ranks high as a cause of ill health. Abscesses at the roots of the teeth are more apt to cause serious trouble than foci elsewhere, because the discharge is locked in, and is liable to be absorbed into the blood stream.

Septic infections cause a drain upon the system, lowering the bodily resistance, and giving an opportunity for other diseases to gain a foothold in the organism whose tissues have been impaired. While focal infections lower an individual's resistance and cause him to be more susceptible to other diseases, they may on the other hand re-establish the greater part of his resistance, if that focus of infection is removed.

Many obscure conditions which are at times diagnosed as influenza might be made clear if we could locate the source of the causative agent or focus of infection. Often this may be found to be located in the tonsils, the roots of teeth, boils, carbuncles, nasal sinuses, ethmoid cells, prostate, seminal vesicles or pelvis of the kidney. Subcutaneous abscesses, and abscesses about the nail are occasionally the source of systemic infection. Furuncles and carbuncles are well known sources of acute bacteriæmia especially in patients debilitated by exhausting diseases, of which diabetes mellitus is an example. In a great many bone and joint lesions the history of an old chronic infection may be obtained.

We sometimes find the gonococcus invading the general blood stream and being carried to distant organs and tissues, causing involvement of such structures as the endocardium, the eye, and the synovial membrane of joints. In fact, this organism has been found invading almost every organ, and every tissue in the body. The most frequent focus from which it enters the blood stream is generally the seminal vesicles in the male and the tubes in the female. In some cases however the posterior urethra forms a focus from which infection occurs.

In the female, Bartholin's glands and the glands of the cervix may harbour infection for a very long time. Not only do we find the gonococcus lurking there, but we may also have the streptococcus, staphylococcus, and other varieties of organisms. This may explain the occurrence of obscure cases of post-partum infection. In the puerperium, an old chronic gonorrhœa which had been thought cured may flare up and give rise to very acute symptoms simulating puerperal sapræmia or septicæmia. Cases of fatal puerperal septicæmia have been attributed directly or indirectly to an old Neisserian infection. It is thought that the tissues attacked may have been so damaged, or their resisting power so lowered by the gonococcus that other pathogenic bacteria may have been given an opportunity to implant themselves, and when the occasion arose as in the post-partum state they have flared up and have given rise to puerperal septicæmia.

Renal infections are frequently metastatic in origin, arising from some focus of infection somewhere in the body. The course of infections of the kidney are often of long duration. Sometimes extending over years, and not infrequently giving a history of some antecedent focal infection, such as a recurrent attack of tonsillitis, a chronic discharge from the ear or alveolar abscesses.

Dental infections, either directly or indirectly, account for many urinary lesions. It has been proven that many of these foci of infection were present long before the appearance of the urinary lesion and on removal of the primary focus the urinary lesions may clear up completely. Certain dental infections appear to have a selective action for the urinary tract. Streptococcal, and staphylococcal infections of the urinary tract have been associated with the same type of infection in distant foci.

Ureteral stricture is a not infrequent lesion of the abdominal cavity, and in the majority of cases appears to have arisen from some previous focal infection. The existence of ureteral stricture has been recognized for many years, but until recently it has been customary to consider tuberculosis, trauma, or incarcerated calculi as responsible for the majority of cases. The histological structure of the ureter is such, that stricture formation does not suggest a primary or local factor. Unlike the urethra it possesses

no glands whose ducts may serve as portals of entry with resultant deep seated inflammation and fibrosis. It has been shown, however, that even after tuberculosis, calculus and trauma have been eliminated as etiological factors, ureteral stricture is not an uncommon condition, and it is the opinion of excellent men that in the majority of these cases, the condition represents a ureteritis of varying severity, secondary to an extra-urinary focus of infection found not infrequently in an infected tooth or diseased tonsil.

EXTRA-UTERINE PREGNANCY

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LESS than two generations ago, the woman who was the unfortunate victim of a ruptured tubal pregnancy, was doomed to almost certain death; whilst to-day, thanks to modern surgical intervention the mortality of this formerly dreaded accident, has been reduced to below 5 per cent. The history of the recognition of pregnancy proceeding outside of the cavity of the uterus, the gradual understanding of its gravity and the development of modern methods for its treatment form one of the most inspiring episodes in the progress of medical science.

Extra-uterine pregnancy was apparently unknown to the ancients. The first reported case is by Albucasis, an Arabian physician, living in Spain, and flourishing about the middle of the eleventh century. He reports a case, wherein he saw parts of a fœtal body escaping from the abdomen of a woman, by the process of suppuration. Another example of a similar nature is reported by Cornax, in the early half of the sixteenth century. The patient having arrived at the termination of pregnancy, had pains resembling those of labour; these were followed by unusual sounds in the abdomen. For four years the abdomen continued to be distended and painful, until at last a fetid discharge issued *per vaginam*. A large abscess formed at the umbilicus, which was opened by an incision, eight inches in length and a fœtus removed. The woman recovered and was able to conceive again.

In 1540, Christopher Bain performed an operation for a long retained fœtus. In the province of Gonzago, not far from the river Po, there lived a woman whose name was Ladovia, but from her great size she was termed La Cavalla. She had been pregnant and the fœtus had died in utero. While the soft parts had sloughed through the vagina, the bony parts had been retained. She recovered and again became pregnant. This was followed by a rapid loss of flesh and her condition became serious. Bain, a travelling surgeon, passing by, offered to attempt to restore her for ten golden pieces, if successful; and her body if she died. The money forthcoming, the woman was tied up, and the surgeon cut slowly through the abdominal wall; and at last opened the uterus and extracted the skeleton of a male child. He then washed out the uterus with some warm wine and aromatics and after cauterizing the edges of the wound, closed it with a suture. She recovered and in a short time had other children, born in good condition.

The first evidence of a true understanding of the cause and phenomena of extra-uterine pregnancy is found in the works of Pièrre Dionis, published in 1718. Concerning the cause of tubal pregnancy Dionis says: "If the egg be too big, or the diameter of the Fallopian tube be too small, the egg stops, can get no farther and shoots forth and takes root: and having the same communication with the blood vessels of the tube, that it would have had with those of the womb, had it fallen into it, is nourished and grows big to such a degree that the membrane of the tube, capable of no such dilatation as that of the uterus, breaks, and the fœtus falls into the cavity of the abdomen, where it sometimes lies dead for many years, and at other times occasions the death of the mother, by breaking open its prison."

The first recorded case of operation for extra-

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uterine pregnancy in America, was performed by Dr. John Bard, a New York surgeon. His communication is dated, December 25, 1759, and states briefly the history. Mrs. Stagg, aged twenty-eight, having had one child, without any uncommon symptoms, became pregnant the second time. She suffered more in this pregnancy than during the first, and at the end of nine months had some labour pains, but no flow of water or other discharge. The pains soon wore off, and there remained a large, hard, indolent tumour inclining toward the right side. In five months she conceived again, and at term, after a short and easy labour, was delivered of a healthy child. Five days after delivery she was seized with a violent fever, purging, pain in the tumour and fetid sweats. At the end of nine weeks as the tumour developed fluctuation, Bard made an incision through the right rectus muscle, and delivered the suppurating body of a full term fœtus. The wound was drained and the patient made a good recovery.

The honour of performing the first operation for a recognized extra-uterine pregnancy, goes to Lawson Tait of Birmingham, England, who operated for this emergency in 1883. Mr. Tait had been earnestly solicited to operate for this condition in 1881, by a physician who had correctly diagnosed a case as one of ruptured extra-uterine pregnancy with internal hæmorrhage. He refused and the patient died shortly afterwards. Unfortunately the first patient operated on died also, but his change of view was so complete, that correctly attributing his failure in the first case to faulty technique, he altered his method and continued to operate upon all such cases. Of the next forty patients, only one died. Truly a brilliant record, which was not long in converting to his views the medical fraternity. Immediate laparotomy is now the rule, although some operators still prefer to wait and see whether their patients are gaining or losing ground before resorting to surgical interference.

There are three primary forms of extra-uterine pregnancy: (1) tubal; (2) ovarian; (3) abdominal.

While primary ovarian and abdominal pregnancies do occur, they are undoubtedly extremely rare, and are difficult of absolute demonstration. In the great majority of cases ectopic gestations are tubal.

Tubal pregnancies may be classified according to the site of the attachment of the ovum, as follows: interstitial, when the ovum develops in that portion of the tube, which passes through the wall of the uterus, or in a diverticulum of this portion of the tube; true tubal, or ampullar, when the ovum develops in the free portion of the tube; and infundibular, when the ovum develops in the infundibulum of the tube, and prevents the closure of the abdominal ostium; cases of this variety are also termed tubo-ovarian.

Interstitial pregnancies usually terminate about the third month by rupture into the peritoneal sac. The patient generally succumbs to hæmorrhage and shock. Rupture into the uterine cavity with the expulsion of the fœtus through the cervix, is possible, as is also rupture into the base of the broad ligament.

True tubal pregnancies terminate by rupture either: (a) upward into the abdominal cavity, or (b) downward between the layers of the broad ligament. When the rupture occurs into the abdominal cavity the hæmorrhage is usually severe, and may be fatal in from sixteen hours to three or four days. When the rupture occurs early and the hæmorrhage is not severe, the fœtus may be absorbed, as the embryonic sac usually ruptures at the same time as the tube. When the rupture occurs downwards, between the layers of the broad ligament, the ovum may perish and all trace of it disappear, while the blood effused may be retained, forming a pelvic hæmatocele; or the ovum may develop for a time, and then burst into the peritoneal cavity; or it may continue to full term by stripping the peritoneum from the pelvic wall as it enlarges. In case the ovum develops for a time and then dies, it may in some cases be absorbed, in others macerated. In the latter case it may ulcerate through the bowel, bladder or vagina and escape. In still other cases the gestation-sac may undergo putrefaction from ingress of bacteria from the bowel, and be converted into an abscess in the broad-ligament, which may rupture into the peritoneal cavity or into the bladder, rectum or vagina. In a few cases the fœtus after death may be converted into a lithopædion or may be mummified, and thus remain for years. *Infundibular pregnancies* may either rupture into the peritoneal cavity or may develop to full term. *Ovarian pregnancies* may terminate by rupture of the sac and profuse hæmorrhage; or an arrest of development may occur at an early period,

and the sac remain a cystic tumour. In some few cases it may advance to full term. *Tubal abortion* is the term applied to a certain rare condition in which the blood is effused into the ovum, destroying it and its attachments to the tube walls. The ovum may remain as a tubal mole, forming a solid tumour; or it may escape with the blood from the fimbriated extremity of the tube into the abdominal cavity.

Etiology of extra-uterine pregnancy.—The ovum usually becomes impregnated while still in the Fallopian tube. If the tube is in a normal condition the impregnated ovum is moved along until it finds its resting place in the uterine cavity. It is therefore probable that the most important factor in producing extra-uterine pregnancy is an abnormal condition of the tubes, arising from either inflammation of the tissues of the tubes, or from parametritic exudations, which lead to their constriction or destruction. Malformations of the tubes are not infrequent, such as diverticula, accessory tubal canals, etc., and have been noticed in connection with extra-uterine pregnancy. Any diseased condition of the mucous membrane of the tubes, or any condition which interferes with their normal peristaltic action, may be said to favour the development of extra-uterine pregnancy. These conditions are generally encountered in women who present a history of a protracted period of sterility.

Symptoms of extra-uterine pregnancy.—In a typical case the patient has been regular in menstruation for some time, when she misses a period. Shortly after this, she has irregular attacks of bleeding, accompanied with sharp, cutting pelvic pain. These symptoms may lead to the suspicion of abortion, which is strengthened by the passage of decidua. One of these attacks may be excessively severe and cause collapse. Not infrequently, these attacks are accompanied by dysuria and rectal tenesmus. The amount of blood lost varies from a mere show to a severe hæmorrhage; with the blood may be found small shreds of mucosa, or even a complete cast of the decidual lining of the uterus. The pelvic pain is usually of a sharp, tearing character; when excruciating, and accompanied by collapse it indicates a serious rupture. A vaginal examination in such cases will reveal the presence of a mass in close proximity to the uterus, which may be found somewhat enlarged. The character of the mass depends upon the situation of the ovum and whether it has ruptured or not. In cases in which rupture has taken place early into the peritoneal cavity no mass may be felt. The ovum, if it survive, may go on developing, in which case signs of pregnancy will continue, an abdominal tumour develop, and finally evidences of a living fœtus will manifest itself. Snch cases may go on to full term and terminate in a spurious labour. In other cases secondary rupture takes place at a later period, when the patient usually dies of hæmorrhage or peritonitis; or if the patient survive, the fœtus becomes mummified or forms a lithopædion, being retained for some time, and finally cast out piecemeal through a fistulous opening.

Diagnosis of unruptured tubal pregnancy by vaginal examination.—There is a tender, elastic lump either behind or to one side of the uterus. Pulsation may be felt over it, but the ovarian vessels will often be felt, if there is a tumour lying behind them. This tender swelling is separated from the uterus by a groove. The uterus itself is a little larger than normal, and the cervix may be beginning to get soft. This softening, however, is seldom observed.

The lump may be either an ovarian cyst or the tube filled with fluid contents from causes other than pregnancy, or a fibroid, but none of these are tender as a rule, nor are they accompanied by a history of irregular hæmorrhage or colicky pains. Practically speaking they should not be considered, for if the lump is suspected to be a tubal pregnancy, an operation to remove it should most certainly be undertaken. It it is found to be only a distended tube or ovarian cyst, by removing it, the patient is benefited. As a practical fact, if from the history and bimanual examination, tubal pregnancy is suspected, it will nearly always be found to be present at operation.

A serious error is to mistake a tubal pregnancy for a retroverted gravid uterus. If there is any doubt, the patient should be anæsthetized and examined carefully; a tubal pregnancy has been ruptured by a too vigorous vaginal examination. On bimanual palpation, the body of the uterus will be found pushed up against the pubes or to one side of the soft doughy tumour. It is sometimes impossible to distinguish the uterus from the tumour without passing a sound, which

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should only be done when it is certain that there is not an ovum in the uterus. Although the cervix is pushed forward, the anterior vaginal wall is not stretched, as it is in retroverted gravid uterus.

If an attempt is made to anteflex a tubal pregnancy, under the belief that it is a case of retroverted uterus, the attempt may easily cause rupture with dangerous and perhaps fatal hæmorrhage. The same statement applies to mistaking a pelvic hæmatocele for a retroverted gravid uterus, and the same distinguishing signs apply. Hofmeier claims that the pulsation of arteries on one side of the cervix and not upon the other is a valuable sign of extra-uterine pregnancy, and is a sign of life in the ovum; it ceases when the embryo dies and the ovum stops growing.

For three or four weeks the tubal tumour is free; quite suddenly it sinks into the pelvis from its increasing weight, and wherever it comes in contact with the pelvic peritoneum the latter is changed into a decidua-like structure to which the walls of the tube adhere. It is often impossible to tell from a physical examination which tube is involved. The history of pain down one limb and not the other is often of value in diagnosticating the side affected.

All obstetricians are now agreed that the treatment of tubal pregnancy before rupture, is to perform a laparotomy as soon after diagnosis as possible and remove the ovum with or without the tube. Every care should be taken to ensure asepsis. A table that gives the Trendelenberg position is a great convenience but not a necessity. The usual preparation of the abdomen of the patient by shaving and painting with tincture of iodine is quite satisfactory. A large enema is to be avoided.

When there is hæmorrhage threatening death there is but one treatment, and that is immediate laparotomy. Some advise waiting until the patient has recovered from shock. But during this interval more blood may be escaping, so that even if the patient is moribund, an immediate operation is advised. When the patient's condition is bad; it is a mistake to waste time in trying to remove all blood, as this involves a great deal of handling of the intestines. In such cases, while the surgeon is securing the bleeding-point, an assistant exposes the median cephalic or basilic vein, and directly the hæmorrhage is under control he starts saline venous infusion.

Fortunately, however, extreme hurry amidst unprepared surroundings is rarely called for, and only in those cases where continuous hæmorrhage is quickly robbing the patient of her life. Usually there is time to prepare the patient and get skilled assistance.

Illustrative Cases

Case 1.—Miss C., aged sixteen years. Admitted to the hospital, complaining of vague pains in her abdomen, especially on the left side; frequency of urination; nausea; occasional vomiting; constipation. Temperature, normal; pulse 90. Blood count; red cells, 3,500,000; white blood cells, 10,000. Urine, normal. Menstruation, irregular. Had not missed a period. On abdominal examination, abdomen found to be tender but no localized point of tenderness could be elicited. A tentative diagnosis of appendicitis was made. Laparotomy was performed by median sub-umbilical incision. Free blood in the pelvis. Appendix and a two months left-side ectopic removed. Patient made a rapid recovery.

Case 2.—Mrs. F., age thirty-seven; has had five children. Complaint: violent pain in the hypogastrium for the past two days. Irregular bloody vaginal discharge for the past two weeks. *Present illness:* patient had a regular menstrual period of twenty-eight days, but the flow was scanty and only lasted three days instead of her usual five to seven days. Since then, she has had a small amount of bleeding daily. She had an attack of acute pain about one and a half weeks ago, which caused her to perspire freely, and make her take to her bed. She applied a hot water bottle to her abdomen and felt better the next day. A few days ago, she had another violent attack on the left side of the abdomen. It was sharp and crampy; she had no vomiting, but felt nauseated. Abdominal and vaginal examination disclosed a tender uterus. Temperature 99; pulse 85; respirations 20; white blood count 12,000; urine, normal. Operation disclosed right-sided ectopic, surrounded by omentum. Rapid recovery.

Case 3.—Mrs. V., age thirty-one. Has one child. *History:* complained of frequent pains in the right iliac region; cessation of regular menses for one month; frequent discharge of menstrual blood; had been taken suddenly with sharp pain and symptoms of collapse, and arrived at the hospital in collapsed condition, but rallied under stimulation.

Operation was undertaken promptly. Incision in middle line; peritoneum bluish. On opening the peritoneum, a large gush of blood took place. Hand quickly inserted down to the right broad ligament which was clamped, arresting the hæmorrhage. Ligatures applied to the sides and middle of the broad ligament. Ovary removed as well as the right tube. Drainage inserted. Next day there was considerable hæmorrhage from drainage tube and the pulse rate was 140. The discharge shortly subsided and the pulse rate gradually improved to normal.

Case 4.—Mrs. P., age twenty-six years. *History:* married three months; complained of frequent colicky pains in her abdomen, with nausea, vomiting and weakness. In the intervals she could get up and do her house-work. Forced to take to her bed during attacks. Patient had not missed any of her menstrual periods but had frequent attacks of dribbling hæmorrhage for past two weeks. She suffered from severe thirst after each attack of pain. The day she was brought to the hospital she had severe pain, and had collapsed. *Operation* revealed an abdomen full of blood, with a ruptured right ectopic pregnancy which was removed. Convalescence gradual.

Case 5.—History: Mrs. M., age thirty. Has had three children; the youngest now two years of age. This case is interesting on account of a double ectopic, three years apart with a living child born between. In 1922, patient had severe colicky pains in the lower abdomen. It was so severe as to cause her to vomit. This seemed to relieve the pain. She had three attacks of this nature, three days apart. On the day following the attack she would feel weak, but felt better on the succeeding day. On the third day, she would feel the pain again. This would usually come on in the morning and was most severe beneath the costal margin. Within a week she commenced to menstruate after having missed two months. This caused considerable dull pain in the hypogastrium, which has continued till the present time. The pain is worse when her bowels move. *Abdominal examination* disclosed abdomen very tender, especially on the right side. Cervix was soft and oozing blood; pulse 94; temperature 100; white blood cells, 15,000; urine, normal. On opening the abdomen a small amount of bloody fluid escaped. The omentum was found to be drawn down and adherent to a mass on the right side. This was full of dark, partly organized blood clot. The omentum was tied off and the mass freed, disclosing an organized ectopic. This was removed. The patient made a good recovery.

In 1924, she again became pregnant and was delivered of a full-time male child.

In the spring of this year, she missed a period and while walking on the street she was seized with severe abdominal pains. She was taken home and hot water bottles applied to her abdomen, with considerable relief. At midnight she became worse with colicky pains, and was immediately removed to the hospital in a collapsed condition. The *operation* disclosed an abdomen full of blood and a left ectopic mass which was removed. The patient made a quick recovery.

Summary

1. Irregular hæmorrhages in a married woman, when accompanied by colicky pains, call for a vaginal examination.

2. The utmost gentleness must be employed when making the vaginal examination, in cases in which extra-uterine pregnancy is suspected.

3. Care must be exercised not to mistake a retroverted uterus for an ectopic gestation.

4. A tender elastic mass either behind, or to the side of the uterus, accompanied by a history of irregular hæmorrhages, colicky pains, faintness and thirst, demands immediate laparotomy.

MULTIPLE MYELOMA OF UNUSUAL TYPE WITH WIDELY DISSEMINATED METASTASES OF SMALL SIZE

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THE case detailed here, in addition to having an interesting clinical history, is so unusual from the pathological viewpoint, that it would seem worthy of being placed on record. Only the salient features, however, of the illness and of the autopsy protocol will be given.

History

The patient in question, Mrs. H. L. J., aged seventy-four years, came of a longlived stock, and had never had any serious illness. During the month of February, 1925, she was laid up with what was thought to be a feverish "cold," with some cough and expectoration. It was noted then that she was somewhat arteriosclerotic: the heart was enlarged to the left, and there was a blowing systolic murmur at the apex transmitted well into the axilla. The urine was free from albumin and casts. Her recovery was satisfactory.

During the summer of the same year, without making any definite complaint, she noticed that she was failing in strength and losing weight. About the beginning of September, pain in the back was noticed. She developed a temperature, and had to take to bed. Her illness was regarded at this time as probably "grippe," aggravated by overwork and the same heart murmur was detected. As she did not improve under the usual measures, including the exhibition of digitalis, she was sent to the Victoria General Hospital at Halifax, on September 21, 1925.

When first examined, she was complaining considerably of pain in the back and sides, particularly on moving. Physical examination revealed the following conditions: the heart was enlarged about one inch to the left, and there was a loud blowing systolic murmur, heard best at the apex, and transmitted well into the axilla. The apical impulse was rather forcible. There were tender spots in the right mid-axilla and in the right mammary line. There were a few fine crackles with inspiration at the base of the left lung behind. At the waist line, and following somewhat the course of the diaphragmatic attachment, were numerous small sessile nodules in the skin, slightly elevated above the general surface, rather pearly in appearance, and surrounded by a reddish areola. The largest would be half an inch long by one-quarter broad. The abdomen was tympanitic and somewhat distended. The sharp edge of the liver could be felt in the epigastrium, but the organ was not enlarged. The temperature was slightly elevated, and varied between 98° and 101° for the next ten days.

When the case did not resolve within the expected time, a suspicion began to be entertained that there might be malignancy. An x-ray examination was made on October 6th, which revealed a general "moth-eaten" appearance of the cervical, dorsal, and lumbar vertebræ, and of the sacrum and ilia. The second lumbar vertebra presented, also, definite marginal erosion. This result almost certainly indicated widespread malignancy. As

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a consequence, a more searching examination was made of the thyroid gland, mammæ, abdomen, and pelvic organs, in order to locate some primary focus, but without success. On two occasions the urine was found to be normal. Albumose was never detected.

October 17th. A blood examination gave the following: red corpuscles 5,960,000 per c.mm.; white corpuscles 25,000 per c.mm.; hæmoglobin 55 per cent. Polymorphonuclear cells constituted 43.5 per cent; small lymphocytes 56 per cent; eosinophiles 0.5 per cent. The red cells were of normal size and shape, but tended to be rather pale in staining. An occasional erythrocyte showed polychromasia. Five nucleated red corpucles were seen in counting the usual two hundred leucocytes. Many of the lymphocytes were immature (lymphoblasts). This result tended to support the diagnosis of malignancy.

October 19th. The patient complained of severe pain in the right axilla, and soon, a slight rub was detected, but no fluid collected at this time. Four days previously a similar pain had been complained of in the left axilla.

November 25th. The course had been progressively downwards. Three or four enlarged and firm lymph-nodes were noticed in the left inguinal region. The thorax appeared to be becoming deformed, as the spine was arching, the sternum projecting, especially at the junction of the manubrium, and the ninth, tenth and eleventh dorsal spines were more prominent. A few areas of thickening could be detected on some of the ribs in the right axilla.

November 27th. One of the larger nodules was removed from the skin for the purpose of microscopical examination. This revealed slight thickening of the epidermis over the nodule. Beneath the skin was a small accumulation of clear, irregularly-shaped cells, mononuclear, some of them resembling plasma cells. They did not suggest an inflammatory process. At the time they were not regarded as definitely of a malignant order, but this opinion, in the light of the subsequent autopsy finding, needs revision. As time went on, the nodules in question did not increase noticeably in size, but many more of them appeared, some over the front of the thorax, and even on the scalp.

January 2, 1926. Œdema began to appear in the legs and over the sacrum.

February 4th. Signs of a moderately severe bronchitis, with mucopurulent expectoration now appeared. This lasted a week or ten days, but never developed into pneumonia. The urine now began to show a trace of albumin.

March 10th. Blood examination: the red cells varied greatly in size, and there was an occasional poikylocyte. Polychromasia and stippling were also noticed. A few nucleated red cells were seen. Polymorphonuclears amounted to 35 per cent; small lymphocytes 62.5 per cent; large mononuclears 2 per cent; eosinophiles 0.5 per cent.

The patient now became unconscious. The anasarca was quite marked; the deformity of the chest was more extreme. Death occurred on March 16th.

The clinical diagnosis was not regarded as certain, beyond the obvious one of disseminated malignancy, but multiple *myeloma* was thought to be most probable.

Autopsy

An autopsy was performed on March 16, 1926. The chest was deep antero-posteriorly. The breasts were large, flabby, pendulous, and the seat of senile involution, but there was no sign of carcinoma therein. There was marked œdema of the lower limbs and trunk, extending as high as the waist-line. The *head* was not examined except externally.

Thorax.—The right pleural cavity contained 450 c.c. of clear, straw-coloured fluid, without flakes. The left contained 315 c.c. of similar fluid.

Heart.—Weight 400 grammes. The organ was large, the right side much distended with soft reddish clot and thick blood. The right auricle, in particular, was much dilated. The tricuspid orifice admitted the tips of five fingers. The tricuspid and pulmonary valves were normal. The mitral orifice admitted the tips of two fingers. The cusps were rather shortened and slightly calcareous along their mural attachment. The aortic cusps were somewhat fused, with calcification at the ring. There was no evidence of leakage here. The heart muscle was slightly hypertrophied, and there was slight fibrosis at the tips of the large papillary muscles. The foramen ovale was closed. The coronary arteries were normal. The descending portion of the arch of the *aorta* was quite atheromatous: this condition was very marked also just above the bifurcation.

Right lung.—Weight, 440 grammes. The lowest lobe was completely compressed and airless. The other lobes showed moderate emphysema. The apex was scarred and adherent from old fibrous bands, and there were also firm fibrous adhesions between the base and the diaphragm. The diaphragmatic surface, as well as the rest of the pleura, for a distance of one inch above the basal margin, was rather thickly studded with small elevated white dots, the size of pinheads, suggestive of new growth. The bronchi were reddened, and the smaller ones full of muco-pus.

Left lung.—Weight, 440 grammes. The lower lobe was completely compressed and airless. The upper lobe was emphysematous. There was one tag of fibrous adhesion at the apex, and the apical pleura showed two fibro-hyaline scars. The bronchi were reddened and contained muco-pus. A few scattered dots, similar to those on the right lung, were seen at the base. The pulmonary artery was normal. *Peribronchial lymph nodes*:—considerably enlarged, anthracotic, and very firm, suggestive of new growth.

Abdomen.—The body wall was œdematous, and the subcutaneous fat almost absent. The peritoneal cavity contained about 600 c.c. of clear straw-coloured fluid. *Spleen*: weight, 170 grammes. There were a few adhesions between it and the diaphragm. The organ was short, thick, and very firm. Its capsule showed some thin fibrohyaline patches. On section, it was firmer than normal, dark red, and congested. *Stomach*: slight thickening of the mucosa, with passive congestion. *Intestines*: the small bowel was congested throughout. In the last foot or two of the ileum three of the Peyer's patches were prominent, elevated somewhat, of whitish colour, and with sharply-defined edges. In the cæcum two or three of the solitary follicles presented the same appearance. *Mesenteric lymph nodes*:—many of these were enlarged and firm, apparently infiltrated with new growth. *Liver*:—weight, 1320 grammes. Very firm, slightly pitted on the surface, pale, and of a grayish-brown colour. On section it gave the impression of a slight fatty cirrhosis. The *gall bladder* and *biliary passages* were normal.

Pancreas.—Normal. *Kidneys*:—both were rather less than average size, and were firm and congested.

Adrenals.—Slightly enlarged. Both contained in their centres several small whitish masses, firm, homogeneous and resembling new growth. *Bladder*:—thin-walled. *Uterus*:—showed senile atrophy. The cavity was dilated and contained three small, soft, submucous polyps. The fundus, externally, was dotted with many pinhead growths, like those on the pleuræ. *Fallopian tubes*: also presented a few small elevated dots, identical with those on the fundus. *Ovaries*: atrophic. *Bones*: about one dozen nodules of new growth, about the size of Lima beans, firm, homogeneous and white, were found on the ribs infiltrating their substance. On pressing with the finger on one such area the rib broke. The bodies of the ninth, tenth, and eleventh dorsal vertebræ were diffusely infiltrated with a similar malignant growth. There was no encroachment on the vertebral

canal, and no gross evidence of pressure upon the spinal cord.

Spinal cord.—This was removed, and appeared normal to the naked eye.

Microscopical Examination

Heart.—Occasional fibres were hypertrophied: the striations were indistinct. At one point in the interstitial substance was a small cluster of large clear, mononuclear cells, of no uniform shape, undoubtedly secondary growth.

Lung.—One section showed collapse and œdema. Other sections were selected from the base of the lung so as to include the pinhead dots already alluded to. The dots in question proved to be small nodules of new growth, composed of large, clear, often vesicular cells. These cells had rather pale, round, oval, or irregular nuclei and an abundance of clear cytoplasm, scarcely stained. For the most part they were polyhedral and irregular in shape, but at times tended to be elongated, with oat-shaped or long pointed nuclei. In the neighbourhood of the pleural growths the lung presented the condition of red infarct. The growths, however, were not specially vascular. The septa of the lung were thickened, and were the site of rather numerous, though small, malignant deposits, especially around the blood-vessels, consisting of cells identical in appearance with those of the pleural growths. Small emboli of tumour cells were noted in some of the blood vessels. A few "heart-failure" cells were seen in the alveoli. Some of the bronchioles contained pus.

Peribronchial lymph nodes.—These contained the usual anthracotic deposits, and were considerably fibrosed in spots. There was extensive diffuse invasion with new growth, similar to that in the lung, and some few isolated tumour cells were noted in the centres of the cortical follicles.

Spleen.—Very fibrous and cut up into a fine sponge-like structure by a close and intricate system of fine fibrous trabeculæ. Very little lymphoid tissue was preserved. One mass of new growth, at least, was definitely identified, composed of pale-staining, round, oval, and polyhedral cells, mostly arranged without particular design but occasionally grouped in rows and imperfect circles.

Small intestine.—The section was made through one of the enlarged Peyer's patches. The inner surface of the mucosa was eroded at one point. The enlargement of the patch was due to a diffuse invasion by new growth, which had involved rather diffusely the muscular, submucous, and mucous layers, causing separation and dislocation of the crypts. The cells composing the tumour masses were somewhat larger here than elsewhere, clear, and of very various shapes. Some were round: others, oval, oblong, square, pear-shaped, and irregular. The nuclei were often situated to one side of or at one corner of the cell. Some cells had two or more nuclei; some were vacuolated. In the more external portions of the bowel wall the cells tended to be smaller and fewer, and spindles were more numerous. *Duodenum*: there was some increase of the lymphoid tissue.

Liver.—Showed rather extensive fatty degeneration, some of the nuclei containing small fat droplets. Some small round-celled infiltration was noted in the portal sheaths. There were fairly numerous minute areas of new growth, within the lobules occasionally, but more often in the portal sheaths. The cells composing these were polyhedral, with large vesicular nuclei, and somewhat pale, inflated looking cytoplasm. These, at times, formed rows, double rows, and imperfect circles, in one region not unlike immature bile-ducts. There was moderate increase in the connective tissue of the portal sheaths, amounting to a slight grade of perilobular cirrhosis. This condition, while often associated with malignant deposits, was not necessarily so, for there were many places where cirrhosis existed alone. Where the parenchymatous cells were not degenerated, they frequently showed hypertrophy. *Pancreas*:—slight atrophy of the acini, with interstitial replacement fibrosis and fatty infiltration was noticed. One small spot of secondary new growth, like those in the liver, was noted in the stroma. *Mesenteric lymph nodes*:—some fibrosis. There were small clusters of large, clear, polyhedral cells, occasionally having excentric nuclei, with scattered isolated cells of the same order here and there.

Kidney.—The secreting cells of the contorted tubules were cloudy and swollen, and most of the tubules were dilated. Many of the glomeruli were atrophic, and some few were fibrosed and hyaline. A few small areas of interstitial fibrosis were noted in the cortex just beneath the capsule. Here also was slight round-celled infiltration. Many hyaline casts were seen in the collecting tubules. One or two hyaline bodies were seen in some small vessels, one of them being calcareous. The arterioles were somewhat sclerosed.

Adrenal.—One section was made from each adrenal, so as to include the new growth. Both showed the same condition. The cortical cells stained well and contained less fat than usual. A small mass of new growth was noted, involving chiefly the cortex. It was composed of rather small polyhedral cells, having rather dark clear-cut nuclei. The cytoplasm was clear and unstained, for the most part. Some of the larger cells, however, presented a cytoplasm that was somewhat brown in tint, quite like the cells of the adrenal cortex. The mass was not specially vascular, and there was no particular grouping of the cells around the vessels. The small cells of the growth were arranged erratically, but, here and there, small straight or curving columns, double rows, and imperfect circles could be seen. Many of the larger cells were 'ballooned' out with fat.

Uterus.—Fibroid and atrophic from senile involution. The arteries were thickened. Large, clear, rounded, mononuclear, vesicular cells, isolated for the most part, could be seen in small clumps between the muscle bundles. These had the same characters as the malignant cells found in the other organs. *Ovary*: of senile type, somewhat fibrosed, with thickened blood vessels. One small area of new growth, similar to the others, was found in a peripherally situated fibrous zone, and one internally around a small arteriole. Besides these, there were scattered masses of lightly-staining spindle cells resembling the spindle-celled transformation of the new growth noticed in some of the other organs. *Mamma*: very fibrous, with a few scattered ducts, tending to be dilated. Some of the ducts contained hyaline concretions. No sign of malignancy.

Spinal cord.—Sections taken from the dorsal region showed no degenerated tracts. There were numerous 'amyloid bodies.' A few scattered cells, resembling those of the new growth, were observed in the transverse commissure.

Bone.—The portions examined were taken from the bodies of the affected vertebræ, and from the nodules on the ribs. The spicules of bone were widely separated by dense masses of new growth, which uniformly filled the cancelli. The cells of the tumour were plumper here than elsewhere, on the whole, and were more closely packed. They were of very various shapes, being round, oval, triangular, spindle, and polyhedral. In some parts there were rough indications of alveoli: in others, the cells lay side by side, with their long axes pointing in the same general direction. In many instances the nuclei were vesicular, and the cell-bodies were vacuolated. Owing to the decalcification of the material, the cells did not stain too well, but the better preserved showed a slight brownish cast in the cytoplasm, an appearance seen also in the hepatic and adrenal growths. While the tumour in the bone seemed to be well provided with capillaries, in no place was there any special relationship between its cells and the vessels. In parts, the growth seemed to be fibrillar, with a predominance of cells of

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the fibroid order, and, in other places, the intercellular ground substance was apparently hyaline.

Skin.—A section, taken fairly through one of the nodules referred to above, showed pathological deposit of cells just beneath the derma, the cells of which were slightly multiplied at this point. There was no sign of inflammation. Within the interstices of the connective tissue in the subcuticular layer were small groups of cells, with isolated clear cells, all of small size and irregular shape, sometimes having excentric nuclei. These cells, while smaller than those of the growth as it occurred elsewhere, were of the same general character. In one instance the cells in question were grouped to one side of a blood vessel, and one small malignant embolus was seen.

Anatomical Diagnosis

Multiple myeloma; secondary in the pleuræ, peritoneum, peribronchial and mesenteric lymph nodes, heart, lungs, spleen, intestines, liver, pancreas, uterus, ovaries, spinal cord, and skin; bilateral hydrothorax; ascites; anasarca; early cirrhosis of the liver; fibroid spleen; senile kidneys; uterus, ovaries, and mammary glands; hypertrophy and dilatation of the heart; arteriosclerosis; compression collapse of bases of the lungs; compensatory emphysema of the upper lobes; bilateral subacute mucopurulent bronchitis; bilateral old pleural adhesions; healed apical tuberculosis of the lungs; decubitus.

The analysis of this case is not devoid of difficulties. Taking a broad survey of it, we find a malignant growth of wide dissemination. It is most in evidence in the bones, and particularly in the vertebræ and ribs. Somewhat less obvious to the naked eye are the similar deposits in the lymph nodes and adrenals. Still less conspicuous are the many pinhead growths found on the pleuræ and peritoneum. From the histological standpoint the various deposits present, in the main, the same general characters, *viz.*, a neoplasm composed of cells of varying sizes and shapes, but in which large clear mononuclear cells, with excentrically-placed nuclei, strongly suggesting plasma cells, predominate, with no tendency to capsulation; but sometimes, at the margins, merging into spindle-shaped cells, and, finally, into fibrils, and, in the case of the osseous deposits, into a hyaline-like substance. The tendency to form fibrils might be interpreted as supporting the view that we are here dealing with a new growth of mesoblastic origin but, again, the occasional arrangement of its cells into columns, double columns, and imperfect circles, might be adduced as evidence of a glandular derivation. Furthermore, the case is complicated by the presence of a considerable degree of fine cirrhosis of the liver, and an extreme fibrosis of the spleen. Are these independent conditions, or are they the result of the presence of tumour masses that have a predilection to form fibrous tissue?

Assuming for the moment that the deposits in the bones are of a secondary character, we have to look somewhere for the primary growth. The most likely places would be in the breast, thyroid gland, adrenal, or bronchus. Only one of these, the adrenal, was the seat of any new growth. Both glands were involved equally; the growths were multiple, quite small, and occupied chiefly the medullary portion, encroaching but slightly on the cortical zones. They had the gross appearance of secondary deposits, having in no degree the well-known characters of the hypernephroma. Microscopically, also, the adrenal tumours bore no resemblance to hypernephroma. There was no capsule; there was no intimate association with the blood vessels; the cells were not laden with fat; there was no hæmorrhagic extravasation; nor did the growth resemble any of the tumours starting in the adrenal medulla—neuroblastoma, ganglioneuroma, neurocytoma, and paraganglioma. No continuity of cells could be traced from any of the cortical zones. Such cells as resembled those of the adrenal cortex probably had become caught and, as it were, imprisoned within the growth. Mixed-cell sarcoma would be a possibility, but in that case we would expect a much larger growth, and histologically, it would be more likely to be composed of a predominance of round or spindle cells.

Coming to the less likely seats of primary malignant growths, nothing suggestive of a primary carcinoma or sarcoma was found in the stomach or intestines. With the exception of the tiny pinhead growths on the surface of the uterus, ovaries, and Fallopian tubes, the signs of malignant deposits in these organs, as well as in the liver and pancreas, were entirely microscopic in size. In the liver, although there were many scattered foci of malignancy and associated with cirrhosis too, the picture was utterly unlike that of primary carcinoma with cirrhosis, as usually described.

By exclusion, then, we are driven to the conclusion that we are dealing with a primary tumour of the bones. Clearly, too, the growth is multiple in its origin. The x-ray pictures taken

early in the illness show that the lesions were confined to the cervical, dorsal, and lumbar vertebræ, sacrum, and ilia—in other words, to the axial skeleton. The ribs were free at that time and the nodules that developed upon them were a rather late development. In view of the very small size of the malignant deposits in the serosæ and internal organs, one seems justified in concluding that these also were a late, perhaps, almost terminal event in the evolution of the case. To use Adami's terminology, we would appear to be dealing with a case of myelomatosis. The gross appearance of the growths, which is the same wherever they are found, *viz.*, a firm, somewhat translucent, homogeneous mass, of grayish colour, is in harmony with the diagnosis of a myeloma of the lymphoid order. Microscopically, the study of the growth could be pursued to the best advantage in the bones and intestinal secondaries, inasmuch as the cells in this situation attained a greater size, and one was struck with the large proportion of them that were of the plasma-cell type. Then, there was the rather pronounced tendency for the growth to produce an intercellular fibrillar substance, which, also, has been noted in connection with myeloma. The cytoplasm was singularly clear, as a rule, and devoid of granules. In the case of the secondaries elsewhere, particularly in the liver, pancreas, and skin, the tumour cells were smaller, having an atrophic appearance. This was more apparent in places where the cells were isolated, or in small masses, amid fibrous tissue. Yet, though the cells were small in this case, they did not depart in shape or other characters from the type of the primary growth.

This point, I think, is important in the farther interpretation of our case. Adami emphasized the conception of a state of tissue growth, intermediate between chronic inflammation and true neoplastic formation (blastoma), which he termed "blastomatoid." It had no qualities of malignancy. To the condition commonly known as *multiple myeloma*, when purely local, he would deny the term, "myeloma" and calls it a myelomatoid.[1] He admitted, however, in the following words that myelomatosis might evince malignancy: "Uncomplicated cases show no metastases, but occasionally an individual mass may take on malignant infiltrative properties, and when this is the case, secondary growths of sarcomatous type may be found in other organs." Other writers also have stated the same thing. Thus, Coplin[2] remarks, "In one type of the morbid process the bone alone is involved, and in another metastases to the lymph nodes and other structures occur." Muir[3] states that, "Secondary growths have been observed in a few cases where the cells were of lymphoidal type." Karsner[4] quotes Symmers to the effect that, "Distant metastasis is not common, but may occur in liver, spleen, kidney, lung and other viscera." He has observed one case in which the tumour was primary in the lower end of the femur and metastasis occurred in the brain. In another place[5] he states that "Metastases to the viscera are not rare." Karsner definitely includes multiple myeloma among the malignant tumours. There can, of course, be no doubt as to the malignancy of the condition under review here. But, in regard to the same condition when it is entirely local, there is a difference of opinion.

It has been suggested that, in cases where secondaries develop, these are possibly not to be regarded as metastases, but rather as an instance of compensatory myelogenic activity on the part of the tissues concerned, when the function of the normal bone-marrow is extensively disturbed. This explanation does not seem to be probable in our case, in view of the demonstration of emboli of tumour cells in the lungs and skin, composed of cells identical with those of the primary growth.

In the matter of the malignant character, or otherwise, of these myelomata when local or confined apparently to the osseous system, I am inclined to side with those who regard them as essentially malignant. The *a priori* evidence is all in favour of this view. The growths are destructive and infiltrating. They grow fairly rapidly. They are composed of hæmatopoietic cells that are immature; perhaps not immature when considered in regard to their situation (in the marrow), but certainly immature when considered in view of their destiny, which is to become leucocytes in the circulating blood. The derivation of plasma cells from lymphocytes is not universally conceded, and a plasmacytoma may well represent an even more embryonic stage. If Adami's statement, that "the myelomatoid may give rise to secondary

growths of sarcomatous type," be taken to mean that such secondaries are, histologically, like the well-known sarcoma forms—round-celled, spindle-celled, or mixed, it is not borne out by the case here recorded. There was no difference between the cells of the primary and secondaries, except in the matter of size.

The blood-changes in true myeloma are not those of leukæmia, but I would like to call attention to the fact that in the case detailed here, there was both a relative and an absolute lymphocytosis. While many of the lymphocytes were of the primitive type, I did not observe any plasma cells in the blood, as MacCallum[6] has done in some of his cases. It, perhaps, should be emphasized that the "multiple myeloma" is an entirely different thing from the so-called "giant-celled myeloma," sometimes termed "giant-celled sarcoma." The former is derived from cells of the hæmatopoietic system; the latter from those of the osteoblastic or osteoclastic system. The giant-celled tumour is composed of cells of mature type; the true myeloma, of cells of immature type. The giant-celled growth is single, local, non-invasive, and does not form metastases. It may properly be called a benign tumour. The true myeloma is usually multiple, invasive, and sometimes forms metastases. It should be called a malignant tumour. In view of the fact that in the case recorded here, many of the metastases were of microscopic size, it may be suggested that cases of multiple myeloma without gross secondaries, should be investigated very thoroughly with the microscope. Unsuspected dissemination of the growth might be found, and possibly, our ideas as to the nature of myeloma might become clarified.

Finally, in our case, the cirrhosis of the liver and spleen appears to be independent of the development of the neoplasm in those organs. There is no constant association between the cells of the secondary tumours and fibroblastic growth. Possibly, though this is thrown out merely as a suggestion, we may have here a form of Banti's disease, not thoroughly developed. It is true that the spleen was of normal size, but it may be answered that a spleen weighing 170 grammes is large for a person of seventy-four years of age.

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Pollen Toxæmia in Children.—The symptoms of this condition, according to I. S. Kahn, San Antonio, Texas, are: Frequent almost nonintermitting so-called colds dating from early infancy, which actually represent the mild type of hay-fever so frequently seen in asthmatic children. Typical severe seasonal hay-fever is unusual. Frequent attacks of bronchitis antedate the initial attack. Infantile eczema is a common story. The family history almost invariably shows hay-fever or asthma. The noses of these children are frequently in a state of prolonged obstruction with almost constant mouth breathing, resembling extensive adenoid growth. Removal of adenoids and tonsils in all these cases had not given relief. Nose picking and rubbing is a common story. The physical examination of these children shows deficient growth and weight, and backward mentality. The complexion is sallow or of a saffron tinge: on the whole, the condition decidedly resembles hereditary syphilis or hookworm infection. The nasal mucosa is typical of vasomotor rhinitis. The chest is barrel shaped, with marked emphysema and heavy generalized râle formation. Cardiac enlargement and murmurs are absent. The abdominal examination is negative. Eosinophilia is uncertain, while a lymphocytic increase is not unusual. The most remarkable result of this toxæmia is psychic in character. The mentality is deficient, the condition resembling that of morons or idiots in severe cases. Languidness and listlessness are the rule, alternating with spells of intense temper and fury. These children are almost invariably extremely cross and irritable, resisting all handling, and crying on the slightest provocation. The appetite is poor and capricious, and nocturnal enuresis is common. Within a few weeks, or at times even days, following the institution of proper measures to control the vasomotor rhinitis by desensitization or pollen precautions, the entire picture changes. With improvement, the complexion clears, appetite returns, and the general physical condition rapidly approaches that of the normal child of that age. —*J. Am. M. Ass.*, Jan. 22, 1927.

THE ANÆMIA OF CANCER OF THE GASTRO-INTESTINAL TRACT*

Based on a Study of 187 Cases

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WHILE it is a common observation that cancer, except in its early stages, is ordinarily accompanied by anæmia, very few accurate studies have as yet been made as to its variation under different clinical conditions, and its relationship to the pathological type of carcinoma as checked by necropsy studies.

The cause of the anæmia in cancer is not, as yet, definitely known. It has been ascribed by G. W. Crile,[1] and by Elsberg, Neuhof and Geist[2] to a hæmolytic toxin engendered by the tumour process, but this theory has not been confirmed on an experimental basis (Roessingh,[3] Lewin[4]). Grawitz[5] believed the anæmia to be apparent rather than real and due to a lymphagogue action of the cancer tissue. To hæmorrhage is generally ascribed an active rôle in the causation of this anæmia. This factor would apply with particular force in cancer of the gastro-intestinal tract where hæmorrhage is of frequent occurrence (fifty-six of sixty-seven cases in our series tested), and due, as Versé[6] and Konjetzny[7] have separately pointed out, to a tendency to vaso-dilatation and ulceration at the periphery of such tumours. By the exhausting effect on the bone marrow of repeated hæmorrhage, an aplastic factor is superadded as demonstrated by the experimental work of Blumenthal and Morawitz[8] which tends to increase the degree of the anæmia.

The present study is based upon an analysis of the blood counts of 187 patients with cancer of the gastro-intestinal tract treated at the Montefiore Hospital between January, 1921, and July, 1925. Most of the patients were far advanced in the disease. From one to fourteen counts were made upon each patient.

Method.—The counts were made in the ordinary way on a Thoma Zeiss hæmocytometer using Hayem's solution for the red cells and a 2 per cent hydrochloric acid solution for the whites. Wright's stain was used for the differential with the usual technique. Hæmoglobin estimations were made with the Sahli apparatus.

In the following tables no significance has been attached to a difference of less than 5 per cent in the cell counts, or in the hæmoglobin estimations. In the differential blood pictures only the polymorphs and the lymphocytes have been detailed since no variation of any significance was found in the other white cell elements.

The cases have been divided into five groups according to the situation of the malignancy. There were sixteen cases of cancer of the oro-pharyngeal cavity, thirteen of cancer of the œsophagus, and seventy-nine of the stomach. There were two primary cancers of the ileum, three of the cæcum, nineteen of the colon, and thirty-seven of the rectum. There were five cases of cancer of the pancreas, and thirteen of cancer of the biliary apparatus, including nine cases of cancer of the gall bladder, two of cancer of the bile ducts and two primary cancers of the liver.

Variation with situation of the tumour.—The lowest red cell counts and hæmoglobin estimations were found in patients with cancer of the stomach. Cancer throughout the rest of the gastro-intestinal tract was associated with a moderate anæmia as shown in the accompanying table, with the exception of cancers of the proximal colon. Cancers of the pancreas and biliary system were also associated with a rather severe anæmia. See Table I.

Variation with sex.—The red cell count in every group was slightly higher in the males than in the female patients tending to keep up

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TABLE I

SHOWING THE VARIATION OF THE AVERAGE BLOOD PICTURE WITH THE SITUATION OF THE TUMOUR

Situation	*Number of cases*	*Percentage of hæmoglobin*	*Number of red blood cells*	*Number of white blood cells*	*Neutrophils*	*Lympho-cytes*
Oro-pharyngeal cavity.....	16	73	3,831,000	8,700	72	22
Œsophagus.....	13	61	3,731,000	10,400	70	21
Stomach.....	79	50	3,179,000	7,840	73	22
Intestine, cæcum, colon....	12	56	3,259,000	9,700	68	26
Sigmoid colon.....	12	68	3,841,000	9,300	72	23
Rectum.....	37	66	3,715,000	9,100	69	23
Pancreas and biliary system	19	58	3,233,000	10,000	71	23

the normal relationship. The average of the hæmoglobin estimations in cancer of the gastro-intestinal tract as a whole is slightly higher in females than it is in males (hæmoglobin 58 per cent and red blood corpuscles 3,459,000 to hæmoglobin 57 per cent and red blood cells 3,397,000) due to the relative predominance of men with cancer of the stomach.

Variation with age of patient.—No effect on the average blood count or hæmoglobin estimation could be found that could be definitely attributed to the age of the patient.

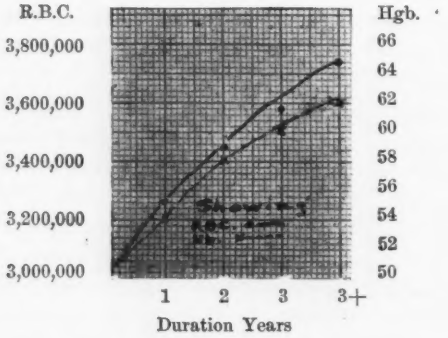
Variation with the duration of the disease.—As will be noticed in Tables II and Fig. 1 a definite increase in the red blood cell count directly proportional to the duration of the disease since the first onset of symptoms was found.

TABLE II

SHOWING THE VARIATION OF THE AVERAGE BLOOD PICTURE WITH THE DURATION OF THE DISEASE

Duration	*Number of cases*	*Percentage of hæmoglobin*	*Number of red blood cells*	*Number of white blood cells*	*Neutrophils*	*Lympho-cytes*
One year and under.....	92	54	3,262,000	9,400	70	23
One year to two years.....	51	58	3,451,000	9,100	70	23
Two years to three years...	24	60	3,581,000	8,700	74	21
Three years and over.....	20	62	3,738,000	10,000	71	25

FIG. 1



Effect of treatment.—Thirty-five of the patients in the series had received surgical treatment (gastrostomy or colostomy with or without resection), and twenty-three had received some form of irradiation previous to the blood estimations. The average blood picture of these fifty-eight showed no essential variation that could be attributed to such treatment.

Variation with clinical condition of patient.—Serial counts on individual cases did not always reveal a progressively downward tendency. The state of the blood might remain at one level throughout a long period or might even show a temporary rise in the blood count with the progress of the disease. Frequently there would be a fall in the red cell count and in the hæmoglobin characterized by considerable fluctuation, presumably indicating repeated and vigorous attempts at blood regeneration in the presence of the persistent action of the blood destructive factor. The time of exitus did not always correspond with the ebb in the tide of the red cell count. Death would occasionally coincide with a tendency to improvement in the red cell count suggesting that the degree of the anæmia in cancer, is not always directly proportional to the condition of the patient.

Cytology.—Among the earliest changes noticeable in the red cell count with increasing anæmia is an enlargement of the central pale area giving the cell a vacuolated appearance. This change does not appear to the same degree in all the cells of the same smear. Changes in size and shape may appear with moderate anæmia; but patients with marked anæmia may show this to only a slight degree. Stippling and polychromasia are not common. Nucleated reds are sometimes seen accompanying anæmias of marked degree particularly in cancer of the

stomach. Any marked leucocytosis is usually referable to an accompanying complication. Severe anæmias are frequently accompanied by an increase in the transitional cells. Large numbers of degenerated neutrophiles are sometimes seen, but these are believed by some to be due to artefacts. Lymphocytes are present in various proportions up to 58 per cent. The platelets show no apparent change in number. In one case in which the rest of the blood picture strongly resembled that in pernicious anæmia there was persistently no decrease in the number of platelets. This suggests that the platelet count might be used as a differentiating factor in those cases of malignancy in which the blood picture is of the "pernicious" type.

Autopsy findings. — In eighteen cases the autopsy findings were correlated with the blood count during life. No relationship could be found between the state of the blood and the extent of involvement of the primary tumour or the degree of dissemination. The situation of the tumour seems to be pertinent to the extent that, generally speaking, the counts are lower in those cases in which the growth is so situated as to cause obstruction. Thus, in the cases of cancer of the stomach the lowest counts were found where the pylorus was the seat of the growth. A marked anæmia was also found in cases of cancer springing from the posterior wall. The next lowest counts were found in cancer of the cardia where the factor of obstruction is obvious. See Table III.

Classification according to histological type brings out the fact, that by far the lowest counts were obtained in adenocarcinoma. The cases of scirrhus and colloid carcinoma showed a count above the average. See Table IV.

The spleen was usually about normal in size and almost always presented the picture of a diffuse fibrosis. Some of the spleens showed a diminution of the lymphoid elements. Only one case showed metastases in the spleen—a case of cancer of the rectum in which the spleen, together with the lungs and liver was involved in miliary metastases. These were located particularly about the borders of the Malpighian bodies.

Cancer of the oropharyngeal cavity.—The series of sixteen cases showed an average blood picture of a moderate anæmia, (Table I) with an average colour index of 1.0. There were only two cases with red blood counts, and hæmoglobin estimations within normal limits—one an apparently healthy, robust man with a small, carcinomatous ulcer of the buccal mucous membrane and the other a woman with far-advanced cancer of the tonsil. There were four cases with a white cell count of over 10,000.

Cancer of the Œsophagus.—Our cases did not show the high red cell counts reported by some investigators.[9] Such high counts have usually been attributed to a concentrating effect upon the blood serum caused by the interference with ingestion associated with obstruction of the œsophagus. We are unaware, however, that such a concentration has ever been demonstrated by actual blood volume measure-

TABLE III

SHOWING VARIATION IN THE BLOOD COUNT AND HÆMOGLOBIN IN CANCER OF THE STOMACH WITH SITUATION OF TUMOUR. DIAGNOSIS OF SITUATION WAS MADE IN MOST CASES RADIOGRAPHICALLY; IN SOME CASES BY ACTUAL NECROPSY DEMONSTRATION

Situation	*Number of cases*	*Percentage of hæmoglobin*	*Number of red blood cells*	*Number of white blood cells*	*Neutrophils*	*Lympho-cytes*
Pylorus	16	47	3,046,000	9,000	70	26
Posterior wall	7	56	3,109,000	8,650	65	23
Cardia	8	55	3,454,000	9,000	72	22
Antrum	4	60	3,575,000	8,800	65	33
Lesser curvature	10	56	3,654,000	7,900	73	20

TABLE IV

SHOWING VARIATION WITH HISTOLOGICAL TYPE OF TUMOUR

Histological type	*Number of cases*	*Percentage of hæmoglobin*	*Number of red blood cells*	*Number of white blood cells*	*Neutrophils*	*Lympho-cytes*
Adenocarcinoma	7	37	2,875,000	8,500	73	25
Carcinoma simplex	5	63	3,355,000	8,000	58	24
Scirrhus	3	62	3,419,000	8,300	74	25
Colloid carcinoma	3	60	3,642,000	5,200	74	23

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ments. That a sudden, complete interference with water ingestion can cause anhydræmia with concentration of all the blood elements is well known. In chronic water starvation, however, there is usually no increase in the formed elements of the blood due to a masking of the concentration by increased cell destruction in a hypertonic serum.[10] The chemical elements of the blood, under such circumstances, do, however, show an increase, as does the specific gravity of the urine.[11] In seven cases of this series in which blood chemistry studies were made, the average blood sugar, urea nitrogen and uric acid were 101 mg., 18 mg., and 2.3 mg. respectively per 100 c.c. of blood. The specific gravity of the urine was also within normal limits. The average cell count was not high but was somewhat less than that of carcinoma of the sigmoid (Table I). Moreover in the six cases that had been gastrostomized and in which concentration was presumably no factor, the count was over 200,000 higher than in the cases not operated on. See Table V.

One patient with a count of 6,000,000 red cell and 30,000 whites, in whom the concentrating factor would seem to have been active, had had a gastrostomy performed some time previous to the blood count. The marked leucocytosis was probably due to the presence of a complicating lung abscess.

Cancer of the stomach.—The colour index in the series of cases of cancer of the stomach averaged 0.7, the lowest of cancer anywhere in the gastro-intestinal tract. That is, under ordinary circumstances, it bears the least resemblance to the anæmia of the "pernicious" type. Nevertheless, anæmias with high colour index do occur in cancer of the stomach with fair frequency. Twenty of the seventy-nine cases, roughly 25 per cent, had a colour index of from 1.0 to 1.5. Such cases, when the clinical history is at all obscure, and when there is no tumour palpable or demonstrable by the Roentgen rays, are frequently mistaken for cases of pernicious anæmia[12]. Particularly interesting was one such case in our series with a colour index of 1.5 and a red cell count of 2,056,000 and a hæmoglobin of 60 per cent, that had been diagnosed as pernicious anæmia in two of the leading hospitals in New York and that, at autopsy, proved to be a case of adenocarcinoma of the pylorus.

When the cases are classified according to the clinical history (Table VI) it is found that the lowest average hæmoglobin and red cell count are found in cases in which hæmorrhage formed a prominent symptom. In these cases also, as we should expect,[13] we find the highest white cell count. Patients that had suffered a marked loss in weight (from sixteen to sixty pounds), also showed a count somewhat lower than the average. Cases in which the malignant process seemed to be based upon a preceding ulcer history gave an average red cell count of more than 400,000 higher than either of the above clinical types although the hæmoglobin content was of about the same value. See Table VI.

Of the seventy-nine cases of cancer of the stomach there were ten with a red cell count of less than 2,000,000. Of these eight were in cases with a duration of one year or under and only three of the ten had received radiotherapeutic or surgical treatment. There were twenty-one cases with a blood count of 4,000,000 or over of which twelve were of a duration of more than one year since the onset of symptoms.

TABLE V

SHOWING THE EFFECT UPON THE CELL COUNT IN CANCER OF THE ŒSOPHAGUS OF A GASTROSTOMY

Treatment	*Number of cases*	*Percentage of hæmoglobin*	*Number of red blood cells*	*Number of white blood cells*	*Neutrophils*	*Lymphocytes*
Gastrostomized	6	59	3,859,000	13,000	74	24
Unoperated	7	56	3,570,000	6,400	75	17

TABLE VI

SHOWING THE RELATIONSHIP OF THE CLINICAL HISTORY WITH THE BLOOD COUNT

Clinical history	*Number of cases*	*Percentage of hæmoglobin*	*Number of red blood cells*	*Number of white blood cells*	*Neutrophils*	*Lymphocytes*
Ulcer history	8	47	3,491,000	8,700	72	25
Loss of weight	16	49	3,088,000	9,100	70	25
Hæmatemesis	18	47	2,969,000	9,700	71	21

Cancer of the colon and rectum.—The anæmia here was of a comparatively high grade (Table I). Of the fifty-nine cases, twenty-four (over 40 per cent) had a red cell count of 4,000,000 or more. One case of cancer of the rectum of six months' duration showed a pre-operative hæmoglobin of 105 per cent and a red cell count of 6,400,000—the highest in the whole series. There were three cases with a red cell count of less than 2,000,000. Of these, of particular interest was one case presenting a profound anæmia to as low as 1,000,000 red cells and a colour index of usually about 0.9, a leukopenia with constant presence of 2 to 6 per cent myelocytes, and an achlorhydria. This clinical picture, in the absence of any etiological factor on physical and on repeated roentgenological examination, so strongly characteristic of pernicious anæmia, was found, at autopsy, to be caused by a small, non-obstructive cancer of the hepatic flexure of the colon.

The forty-nine cases of cancer of the sigmoid and rectum had an average hæmoglobin and red cell count of 10 per cent and over 500,000 respectively more than the ten cases in which the tumour was situated higher up in the colon.

Cancer of the pancreas and biliary apparatus

Five cases of cancer of the pancreas showed an average red cell count of 3,436,000 with a hæmoglobin of 64 per cent. Two cases of primary carcinoma of the liver showed an average red cell count of 3,834,000 and twelve cases of cancer of the gall bladder and bile ducts an erythrocyte count of 3,048,000. The average of all these was 3,233,000.

Comment.—An outstanding observation in this study is the fact that cancer of the stomach is associated with an anæmia which is more severe than that accompanying cancer in any other portion of the gastro-intestinal tract. While attention has been repeatedly drawn to this by various observers, no one, as far as we are aware, has as yet been able to offer an adequate explanation. Certainly, it would appear that one must presume some factor additional to mere hæmorrhage in order to explain this very low grade anæmia, for this symptom does not seem to be of as frequent occurrence in cancer of the stomach as in cancer elsewhere in the gastro-intestinal tract. Hæmorrhage in cancer of the stomach as judged by the presence of occult blood in the stool or in the gastric contents was found in our series in twenty-three of thirty cases tested approximately 77 per cent. In cancer of the large bowel and rectum blood was found in thirty-three of thirty-seven cases tested, or about 90 per cent. It was noticed moreover, that in the cases of cancer of the pancreas and of the biliary system—organs intimately connected with the process of digestion—the red cell count is quite low, approaching somewhat that found in cases of cancer of the stomach. These facts suggest a probable relationship between the extent of interference with the digestive functions and the degree of the anæmia.

That the gastric achylia associated with cancer of the stomach is a factor in the aggravation of the anæmia of that disease is suggested by the observation that patients who have been subjected to a complete gastrectomy sometimes develop, after a time, a condition of profound anæmia resembling clinically and hæmatologically the picture of primary pernicious anæmia. Moynihan[14] has described such a sequel in one of his own operative cases where the clinical findings were subsequently confirmed by autopsy. Hartman[15] has recently described a similar case in more detail.

Assuming an etiologic relationship between the achylia and the profound anæmia in cancer of the stomach, the mechanism by which this would be produced is not clear. Hartman suggests that the absence of normal gastric ferment action in the stomach might result in the absorption of incompletely digested, toxic, presumably hæmolytic split proteins. The usual absence of signs of hæmolysis in the serum of cancer patients would, however, make this improbable. It has been suggested that the absence of hydrochloric acid removes from the gastric juice its normal bactericidal qualities, and thus permits the occurrence of putrefactive processes in the stomach and their absorption in the bowel. It would seem, however, that the impairment in digestion associated with the absence of a normal amount of hydrochloric acid might in itself, by interference with the general nutrition, be the factor in the aggravation of the anæmia. This idea would appear to be supported by the observation that those cases of cancer of the stomach that had suffered a great loss in weight were associated with a particularly low red cell

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count, and the fact that a severe anæmia accompanied cancer of the pancreas and the biliary system. The very marked anæmia in cancer of the stomach might, therefore, be ascribed particularly to two processes: the ordinary effects of repeated, persistent hæmorrhage, supplemented by the impaired nutrition associated with the gastric achylia.

The rise in the average red cell count and the hæmoglobin content directly proportional to the duration of the disease is somewhat difficult to explain. One thinks of the possibility that, in time, there may be a tendency for the blood-forming organs to accommodate their output to the small, persistent drain upon their resources. This is suggested by the findings of Friedman[16] who reported high red cell counts and hæmoglobin estimations amounting to polycythæmia in cases of duodenal ulcer. Moreover, since the counts were made upon patients in different stages of the disease, it is possible that we take the effect for the cause, namely, that only those cases that had a relatively well functioning hæmatopoietic system survived for the longer periods. Pertinent in this matter seems to be the finding of the various workers on "cancer serum"—that in no case was hæmolysis found in patients far advanced in the disease.[1, 2]

It is not surprising that the cases of cancer of the stomach characterized clinically by repeated hæmorrhages should show a particularly low red cell count. It is, however, somewhat paradoxical, particularly in view of this finding, that the cases based presumably upon an old ulcer, with a gastric history dating back from five to ten years before admission should present a red cell count above the average, especially in view of the fact that gastric ulcer is ordinarily accompanied by a slight anæmia.[17] The low counts associated with a marked loss in weight might presumably be due to a digestive factor, the anæmia and the loss in weight being both due to the same process.

The histological type of the tumour has a bearing upon the degree of the anæmia, which is probably not a specific one but is rather, as Ewing[18] suggests, dependent upon its associated tendency to cause ulceration. Thus a highly cellular, rapidly growing adenocarcinoma with its marked tendency to produce necrosis and ulceration would be apt to favour hæmorrhage and infection, and hence be associated with a more severe anæmia than the more slowly growing scirrhus and colloid tumours. The same comment would apply to the observation that the extent of metastasis or the degree of extension does not seem to have any direct bearing upon the degree of the anæmia.

Summary and conclusions.—An analysis is presented of repeated blood counts made upon 187 patients with cancer of the gastro-intestinal tract. One gains the impression that the degree of the anæmia is dependent upon the balance of many processes, among which hæmorrhage and the impaired nutrition associated with gastric achylia or with obstruction in the gastro-intestinal tract play important rôles. The red cell counts and the hæmoglobin estimations were higher in direct proportion to the duration of the disease. The age of the patient seemed to have no specific effect upon the degree of the anæmia. The cases of cancer of the œsophagus showed no evidence of concentration of the blood serum. The most severe anæmia was found associated with cancer of the stomach. In this disease the counts were particularly low in those patients in whom hæmorrhage was a marked clinical symptom; but the cases based apparently upon an old ulcer history showed a red cell count above the average. The cases of cancer of the stomach associated with emaciation showed a low count presumably due to impairment of digestion. Low counts were also usually found in cases in which the tumour by its size or situation caused obstruction. Adenocarcinoma seems to be associated with a more marked anæmia than scirrhus or colloid cancer probably due to its greater tendency to cause ulceration. There is no apparent relationship between the extent of involvement and degree of dissemination and the grade of the anæmia. Patients who had been subjected to operative interference or radiotherapy presented no definite alteration in the state of their anæmia as a result of such treatment.

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THE MEIOSTAGMIN REACTION IN THE DIAGNOSIS OF CARCINOMA

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AMONG the most important reactions proposed for the diagnosis of cancer, are the complement fixation test of von Dungern,[7] the cytolic reaction of Freund and Kaminer,[11] the precipitin reaction, the Abderhalden reaction,[10] the anaphylactic reaction of Ransohoff,[24] the complement fixation with the *Micrococcus neoformans* of Doyen[34] and the Botelho reaction.[9] The last-mentioned has been criticized by Fry,[12] Magaluti[21] and Micheli and Ganelli.[23]

The anaphylactic reaction of Ransohoff and the complement fixation with the *M. neoformans* of Doyen have not given favourable results in my hands;[13] and none of the above-mentioned reactions seems to have withstood the criticism of the various schools.

The fact that the surface tension plays an important part in biological problems was already observed, among others, by Traube.[29] This investigator, in his extensive work on the subject, proved the importance of this physico-chemical phenomenon in intricate problems of immunity and foresaw the application of this new method of investigation to clinical medicine. He also introduced the stalagmometer, an instrument for measuring the surface tension. A few years later, Ascoli[1] applied this new method of investigation, which he called the "*meiostagmin reaction,*" to the diagnosis of typhus, syphilis and tuberculosis. Still later, Ascoli and Izar[2] succeeded in applying it to the diagnosis of malignant tumours, in which they claimed very satisfactory results, having obtained ninety-three positive out of 100 cases of malignant tumours examined.

The principle of this reaction is based on the fact that when a serum of cancerous origin is mixed with an appropriate antigen, its surface tension, as measured by the stalagmometer, is lower than that of a normal serum under similar conditions.

The lowering of the surface tension, given by the cancerous serum, is explained by Izar as a "loss or diminution, on the part of the tumour serum, of substances which have the property of fixing the fatty acids." The carriers of these fixing agents, according to Waterman, are the albumins and principally the lipoids. These lipoidal substances thrown into the circulation by the presence of a tumour are detectable only when combined with analogous lipoidal substances contained in suitable unsaturated fatty acids (antigen). That such combination among these lipoidal substances has taken place is manifested by the meiostagmin reaction. "The meiostagmin reaction manifests itself only after the establishment of a tumour process; we are in this way compelled to admit that the reaction is the consequence of the tumour process" (Waterman).[31]

Antigen.—The original antigen proposed by the authors of the reaction was an alcohol-ether extract of tumour. Later, owing to technical difficulties in its preparation, this extract was replaced by a methylic antigen also prepared from tumour. Soon after, Micheli and Cattoretti[22] succeeded in preparing the extract from the pancreas of dogs, of calves and of pigs, with the same technical procedure used by Ascoli and Izar, showing by this, that it was not absolutely necessary to prepare the antigen from tumours. These antigens, as was also confirmed by Ascoli and Izar,[2] although very sensitive for the meio-

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stagmin reaction, had the great disadvantage of being very unstable so that fresh antigens had to be prepared each time the reaction was to be performed and, having to be titrated for their activity, caused so much loss of time as to be unpractical. This fact induced Izar[16] to prepare synthetic antigens from an emulsion of miristic acid, then with proteins and miristic acid dissolved in gelatine, and then from a mixture of linolic and ricinolic acid. The last mentioned proved to be the most reliable of all the synthetic antigens, having the great advantage of being easily prepared when obtainable from a reliable firm.

There is no doubt that the play of these unsaturated fatty acids in the diagnosis of various pathological conditions, and particularly of malignant tumours, has added numerous and very important contributions to pathology. Dietrich,[5] Kahn,[17] Potthoff in conjunction with the latter, and Weis-Ostborn with Ehrentheil[32] have also contributed towards the solution of this important problem.

The surprisingly encouraging results obtained by Ascoli and Izar led to a series of investigations and, as far as can be gathered from the literature, no one has yet denied the value of the reaction, as may be noted from the following results obtained by various authors: D'Este,[6] eleven positive results out of twelve cases of carcinoma examined; Micheli and Cattoretti,[22] sixteen positive out of eighteen cases; Stabilini,[27] thirty positive out of thirty-two cases; Verson,[30] ten positive out of eighteen cases; Tedesko,[28] twenty-eight positive out of twenty-nine cases; Roosen and Blumenthal,[25] sixty-four positive out of sixty-eight cases; Waterman,[31] ninety positive out of 100 cases examined. The above results would lead one to regard this reaction as being of the greatest clinical importance in the diagnosis of malignant tumours.

The greatest obstacle to the reaction was, however, not yet overcome. The ricinolic and linolic acids, to begin with, as found by Izar himself, are of various composition and, consequently, the antigens prepared vary with the different stocks of such acids. Although this fact induced Izar to prepare the ricinolic acid from the seeds themselves, yet he adduces that the larger part of the ricinolic acid preparations, however obtained, are not adequate for the reaction, as it seems that the greater the chemical purity of these substances, the less reliable are the antigens and the rapid decomposition of these non-saturated acids detracts from their stability. The lecithin extracts of Ferrari and Urizio,[8] the lecithin-acetone extracts of Kelling[19] and Zarzicky,[35] and that of Köhler and Lueger[20] were equally labile.

In 1924, Grevé,[14] working for a more reliable antigen, replaced the unsaturated by the more stable saturated fatty acids, at the same time eliminating the use of alcohol, for the reason that this substance, even in minimal amounts, has the power of lowering the surface tension. He first tried undecylic acid but, owing to difficulties with its solubility in water, no satisfactory results were obtained. He found, however, that normal capronic acid remained constant for months, when suspended in NaCl solution. Izar had previously worked with these acids without success, owing to their being in alcoholic solution. With this antigen, Grevé claims 100 per cent positive results with the meiostagmin reaction. For further details regarding this method, one is referred to the original work of Grevé. According to this author, "the results obtained, considering the clinical findings, are valuable and indicate *in toto* that the reaction is of useful diagnostic help even in general practice, especially when the positive results obtained in non-carcinomatous patients are offset by the symptomatology of those diseases which are very rarely to be confused with malignant tumours."

Izar also succeeded in obtaining a flocculation reaction with cancer serum, using a hydro-alcoholic antigen from the above-mentioned fatty acids. This reaction is based on the same principle as the Meinicke and the Sachs-Georgi reactions for syphilis. Using fatty acids, Grevé proposed a flocculation reaction similar to that of Izar, which he claims to be equally valuable. Although Rostock's[26] results, in a control research with the flocculation reaction did not coincide entirely with those of Grevé in carcinoma, yet, as regards sarcoma, the results obtained at the hands of both authors were always negative.

Personal experiences.—The purpose of this research was to control the validity of the reaction, to compare the efficacy of the extract of Ascoli and Izar with that of Grevé, and furthermore to see if mice affected with sarcoma respond to the reaction. Some time ago, I had the pleasure of learning the technique of the meiostagmin reaction from the authors themselves at the University of Catania and, later, began a research in this field in the Cancer Institute in

Berlin, under the supervision of Dr. Hans Hirschfeld. I used alcoholic antigen of linolic and ricinolic acid kindly supplied by the authors and also some which I prepared myself with substances obtained from Dr. T. Schuchardt, Görlitz, Schlesien. I adhered scrupulously to the instructions obtained from the authors of the reaction and to those given me by Traube for the use of the stalagmometer (old model) giving 54.55 drops of distilled water at a temperature of 20 C.

Technique.—To a test tube containing 9 c.c. of 0.85 per cent NaCl solution is added 1 c.c. of the suspected serum and 0.01 c.c. of the antigen which has been previously titrated. (For the method of titration, see original papers[1, 2, 16]). To a second test tube containing the same amount of NaCl solution, 1 c.c. of the same serum, without antigen, is added. The two test tubes are gently shaken and put in a water bath at 50 C. for one hour, after which time they are removed from the bath and cooled at room temperature for two hours. The surface tension of both fluids is then measured by means of the stalagmometer. If the surface tension of the suspected serum combined with the antigen is lower, as manifested by a larger number of drops, than that given by the serum without antigen, the reaction is said to be positive. It is generally agreed that with the Ascoli-Izar antigen, a serum may be considered positive if the difference in drops of the serum with antigen is of 1.5 drops or more. For more details of technique the reader is referred to the original work of the authors.[1, 2, 16]

The following is the technique adopted by Grevé: "To 220 c.c. of 0.85 per cent NaCl solution 0.1 c.c. of normal capronic acid (C. A. F. Kahlbaum) is added. The container is shaken vigorously a few times and then left standing until the foam has disappeared. This amount of stock solution is sufficient for twenty tests and remains good for use for months. In a test tube is put 1 c.c. of the serum to be examined and 9 c.c. of 0.85 per cent NaCl solution; in a second test tube, 1 c.c. of the same serum and 9 c.c. of the stock solution. The test tubes are now put in a water bath at 50 C. for one hour, after which they are removed from the bath and cooled for two hours at room temperature. The count is then made with the Traube stalagmometer. Normal sera give a difference of less than two drops; the tumour sera, more than two drops." With the exception of using normal capronic acid of different manufacture,* I followed the above-mentioned technique for the Grevé antigen.

I also used the Cenco-du Noüy tensiometer in conjunction with the Grevé antigen to measure the tension of some human sera and some sarcomatous mouse sera.

Ishiwara,[15] working with the Levin and the Landsteiner strains of rat sarcoma and using lecithin extracts prepared according to the method of Köhler and Lueger[20] in conjunction with the stalagmometer, found that the meiostagmin reaction appears as early as the twentieth day after transplantation and is always evident after the fortieth day. The appearance of the meiostagmin reaction has no relation to the size of the tumour, nor with the strain of sarcoma. The reaction is not given by refractory rats. Izar obtained a positive meiostagmin reaction in mice after two and four days from the transplantation of sarcoma, using homologous antigens, antigens prepared from the same strain of sarcoma with which the mice were transplanted and not with synthetic antigens.

I used strains of transplantable mouse sarcoma supplied by Dr. L. C. Strong of the Bussey Institute, Boston, and strains of Crocker sarcoma No. 180 supplied by the Rockefeller Institute. The serum was obtained from the above transplantable mouse sarcomata of three weeks' growth when the tumour had reached the maximum growth and before it had become soft. Care was taken to eliminate any tumour which had become secondarily infected.

Following the original method of Ascoli and Izar, using a ricinolic-linolic antigen in conjunction with the Traube stalagmometer and considering positive those sera which gave 1.5 or more drops difference, out of thirty-nine cases clinically diagnosed as carcinoma, twenty-six gave a positive and thirteen a negative reaction; out of sixty sera in which carcinoma was clinically excluded, thirty-one gave a positive and twenty-nine a negative reaction; of twenty-one normal sera, all reacted negatively with the exception of one.

Using Grevé's antigen with the Traube stalagmometer and considering positive those sera which gave two or more drops difference, out of twenty-five cancerous sera, twenty-three gave a positive and two a negative reaction; of twenty-five sera in which carcinoma was clinically excluded eight gave a positive and seventeen a negative

* This was a product of the Eastman Kodak Co. of Rochester, N.Y.

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reaction; seven sarcomatous sera all gave a negative reaction; and sixteen normal sera all reacted negatively.

Using the Grevé antigen with the Cenco-du Noüy tensiometer and considering positive those sera which gave two or more dynes difference, out of thirty-one cases of clinically diagnosed carcinoma, twenty-six were positive and five negative; of twenty sera in which carcinoma was clinically excluded, three were positive and seventeen negative; six cases of sarcoma all reacted negatively; and of thirteen normal sera, ten were negative and three positive. Of thirteen sarcomatous mouse sera, three were positive and ten negative; and of twelve normal mouse sera, five gave a positive and seven a negative reaction.

Investigators like Roosen and Blumenthal,[25] Blumenthal,[3] Burmeister,[4] Wissing,[33] Grevé and Izar himself, all agree that the meiostagmin reaction may be positive not only in cancer but also in most feverish conditions and in nephritis, pregnancy, cirrhosis of the liver, advanced cases of pulmonary tuberculosis, diabetes, in chronic poliarthritis rheumatica and in uræmia. In general, according to Grevé, "the meiostagmin reaction seems to be connected with principally all conditions of abnormal and high degree of protein katabolism." The large number of authors who have employed the meiostagmin reaction for the diagnosis of cancer unanimously agree that the reaction is of indisputable value and as has already been observed by Roosen and Blumenthal and later by Burmeister, "a decidedly negative reaction is of more value than a positive one and may be considered of some weight in ruling out carcinoma." "Of all cases of carcinoma examined, not one gave a negative reaction" (Grevé). The assertion of this author is also confirmed by Wissing thus: "There is not the least doubt that the reaction will give a valuable diagnostic information where the usual method of investigation fails." Kelling[19] emphasizes the importance of the reaction as a great practical aid, especially in differentiating between malignant and benign growths of the digestive tract.

One of the most important requisites of the meiostagmin reaction seems to be its very early appearance as compared with the other means of investigation at our disposal. "The sensitivity of the reaction is a relatively great one in that the reaction in an early stage may already be positive" (Waterman). This has also been confirmed by Wissing who says: "In each of nine patients with carcinoma varying from the size of a cherry to that of a walnut, all gave a marked meiostagmin reaction." Wissing also notes that "The most important fact is that the meiostagmin reaction is also negative in all those clinical conditions which could be easily mistaken for cancer such as benign tumours, gastric ulcer, chronic gastritis, chronic enteritis and colitis, ulcus cruris, in surgical tuberculosis without fever, in chronic inflammation of the female genital organs and in syphilis." One might also add "in sarcoma".

Conclusions

1. With the previously mentioned favourable results and the general approval of investigators, we may well recur to the meiostagmin reaction which, within its limits and in expert hands, seems to be of the greatest help in incipient and obscure cases of malignant growths.

2. The ricinolic-linolic antigen of Ascoli and Izar, in my hands, has proved less constant in its efficacy than the capronic acid antigen of Grevé.

3. The meiostagmin reaction is always negative in human sarcoma, while in mouse sarcoma, using synthetic antigens, it has not proved itself to be of any practical importance.

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REMARKS ON THE DEEP MUSCLES OF THE BACK, WITH REFERENCE TO INFANTILE PARALYSIS

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THE opportunity of examining in the Shriners' Hospital for Crippled Children, Montreal, several patients suffering from scoliosis attributed to infantile paralysis, a privilege for which I have to thank Dr. A. Mackenzie Forbes, has suggested the following considerations concerning poliomyelitic paralysis of the deep back muscles.

When we think of muscles we usually visualize limb muscles first, because, generally speaking, we are more familiar with the muscles of the limbs than with those of the trunk. Similarly, when our minds turn to infantile paralysis, our first thought is of helpless, withered, deformed little limbs, which we long to restore to usefulness and comeliness.

A typical limb muscle has a well-defined origin, an even more discrete insertion, and, by virtue of its attachments, one or more actions which (*typically*, be it remembered) are fairly definite and localized; it is supplied by a single nerve trunk the motor fibres of which are the axones of ventral horn cells situated in but two or three segments of the spinal cord.

When such a muscle suffers in infantile paralysis, the entire muscle may be completely paralyzed, or the condition may manifest itself as an incomplete paralysis of the muscle *as a whole;* it is not common to succeed in establishing that only a portion of the muscle is affected, the remainder having escaped entirely. Strictly speaking, the latter condition must occur, but it cannot usually be demonstrated clearly owing to, (a) the limited segmental innervation of the individual limb muscles, and (b) the focusing (as it were) of the actions of such muscles to produce a limited number of well-defined and localized movements, in the execution of which all parts of the muscle come into play.

The *superficial* muscles of the back, of which the largest and most important are the trapezius and the latissimus dorsi, are limb muscles and exhibit no very radical deviation from the above account. It is quite otherwise, however, with the *deep* back muscles. The majority of these differ from the typical limb muscles upon every one of the anatomical points noted. The origin and insertion of each muscle is diffuse, consisting for the most part of tendinous slips attached to various portions of several vertebræ and ribs; as a result of this its action is exerted upon a number of bones and is thereby rendered less clear-cut and obvious, but more widespread. Finally, each such muscle is supplied not by a single nerve trunk but by a number (frequently considerable) of separate spinal nerves (dorsal rami), the motor fibres of which are the axones of ventral horn cells situated in a corresponding number of segments of the spinal cord. If an attempt at epigram be permissible, it might be said that whereas the typical limb muscles present discrete attachments, discrete actions

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and a discrete nerve supply, the deep muscles of the back exhibit diffuse attachments, diffuse actions and a diffuse nerve supply. It may be added that whereas in the case of the limb muscles the segmental innervation is frequently more diffuse than is the peripheral innervation (since a single peripheral nerve trunk in the limbs may be derived from several segments of the spinal cord), in the case of the deep back muscles, on the other hand, the peripheral and the segmental innervation are equally diffuse because they are identical (since the motor fibres in each peripheral nerve trunk in this region—*i.e.*, in each dorsal ramus of a spinal nerve—are derived, practically speaking, from but a single segment of the spinal cord).

Of all the deep back muscles likely to share in the production of a paralytic deformity, by far the largest is the sacrospinalis (*erector spinæ*) which is seen and felt as a fleshy bundle on each side of the vertebral spines in the lumbar region. In the neighbourhood of the lower ribs it separates into three longitudinal divisions, each of which, consisting in reality of several small muscles more or less overlapping one another, extends up into the back of the neck; these divisions cannot be identified from the surface, however, being relatively small in size and overlain by trapezius, latissimus dorsi and the rhomboids.

When infantile paralysis attacks the deep back muscles, owing to the diffuseness of their nerve supply, segmental and peripheral, it is very likely that only a portion of a muscle may be affected, the remainder escaping entirely, particularly if the muscle be large, as in the case of the sacrospinalis. Not only so, but in the deep parts of the back there are a number of different muscles, some constituting the longitudinal divisions of the sacrospinalis, others not so included. Can we, then, in such cases establish precisely which muscles or portions of muscles are affected? We might endeavour to obtain this information, (a) by ascertaining whether or not the action of the particular muscle (or part of a muscle) in question is being performed, and (b) by palpating over the appropriate surface area to feel whether or not the subjacent muscle is actually contracting. Unfortunately both of these methods are applicable only in the case of the lumbar portion of the sacrospinalis, for the following anatomical reasons.

Although the deep muscles of the back are attached to a large number of separate bones, the multiplicity and inter-connections of the latter preclude their being moved in a clearcut, localized manner, individually or even in small groups; thus in spite of the anatomical difference between their attachments, the action test for paralysis of a *portion only* of a muscle is no more applicable clinically to the deep back muscles than it is generally to those of the limbs. The actions of the lumbar portion of the sacrospinalis upon the upper part of the trunk as a whole are, however, sufficiently definite to enable them to be utilized for this purpose.

As indicated above, the majority of the deep muscles of the back (except some in the back of the neck) are so small and so completely covered and obscured by the superficial muscles that estimation of their action by palpation is not feasible. To this also, as already pointed out, the lumbar portion of the sacrospinalis constitutes an exception, for, being covered only by the dorsal layer of the lumbo-dorsal fascia (together with skin and subcutaneous tissues), it is usually easily visible and palpable, particularly when in action. Atrophy of the other deep muscles, however, may be revealed in certain cases by increased palpability of the underlying dorsal parts of the ribs.

We see, then, that infantile paralysis is much more likely to affect a *portion only* of a deep muscle of the back than it is in the case of a typical limb muscle. Unfortunately, however, it may be almost, if not quite, as difficult to detect such a type of partial paralysis in the case of a back muscle as in the case of a limb muscle. Of course the presence of a deformity may assist us to arrive at a conclusion. The demonstration that one portion of a muscle is normal must not be taken to mean that the whole muscle has escaped. In particular, care should be taken not to assume that if the easily examined lumbar portion of the sacrospinalis be normal, the less accessible upper portions of the muscle are necessarily in a like happy condition, and on this ground hastily to rule out paralysis thereof as a possible cause of such deformity as may be present.

The foregoing considerations prompted Dr. Forbes to ask: Could anything of the nature of a Stoffel or some similar operation be per-

formed upon the segmental nerve trunks supplying these deep back muscles? A study of these nerves from this point of view leads to the conclusion that the dissection required would be so extensive (in many cases) and so difficult (in all cases) that the feasibility of such an operation may be gravely doubted. It remains, however, a theoretical possibility, and from this nebulous realm it may some day be elevated. Perhaps, however, before that day arrives preventive medicine may have abolished the necessity for such operations.

NOVA SCOTIA'S CHANGING STATISTICS

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DURING the past few years very marked changes have been making themselves evident in the vital statistics of the Province of Nova Scotia. Especially is this the case in the mortality statistics, the ones most carefully scrutinized, and the ones in the measurement of which the greater number of indices are used. The great indices by which the mortality of a district is measured are the general death rate, either crude or standardized, the rate of infant mortality, and the rates for certain specified diseases, tuberculosis being usually an important one. The changes which have occurred in Nova Scotia are those which are usually taken as signs of improvement. They indicate that the population of the Province is dying in smaller numbers than was the case a few years ago.

During the five year period 1908 to 1913, the crude general death rate per 1,000 varied between 13.8 and 16.7, being approximately 14.8 for the period. The infant mortality rate varied between 102 and 131 per 1,000, the figure for the whole period being 114. The tuberculosis death rate per 100,000 was as high as 216 one year, and as low as 175 in another, approximately 194 for the period. That these figures are for the years ending September 30th of each year has here no significance.

During the five year period ending in 1925—and here the figures are for calendar years—quite a marked change is seen. The general death rate was in no year higher than 12.9 per 1,000 and, was as low as 11.5 or approximately 12.4 for this period. The infant mortality rate per 1,000 was 102 at its highest and at its lowest 78, or 94 for the whole period. The tuberculosis death rate dropped from the highest, 133 to, 108 per 100,000, the lowest figure, with approximately 124 as the rate during the five years.

These can best be shown for comparative purposes in a table.

Period	*General death rate per 1000*	*Infant mortality rate per 1000*	*Tuberculosis rate per 100,000*
1908–1913.....	14.8	114	194
1921–1925.....	12.4	94	124

That, during this period, a period of falling death rates, there has also been a fall in the birth rate is to be expected in the light of other experiences. In this respect Nova Scotia has conformed with other countries. The natural increase, however, that is, the differences between the number of births and the number of deaths taking place was 25,790 for the whole of the first period and 28,000 for the second. The improvement in the death losses offset the smaller number of births, the rate of increase in the two periods being almost identical at 1.04 per thousand per year.

It is not the intention to discuss this phase, but to endeavour to ascertain where the changes have occurred, and to draw some deductions concerning their significance.

Some information is obtained if an examination is made of the ages at which death took place, especially if this is considered in relation with the age of the living. One of these, the average age of the living can only be told from the census figures; the other is obtained from a tabulation of ages at death obtained from the death certificates, and consequently available for each year.

In this Province, these were during the census years 1911 and 1921 as follows:—

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Year	Average age of the living	Average age at death
1911.....	28.42	40.99
1921.....	28.68	44.71

It will be seen that the average age at death has materially changed. The progressive change taking place from year to year can best be told from another table.

Year	Average Age at Death Male	Female	Total population
1910.....	40.50	41.93	41.21
1911.....	40.05	42.04	40.99
1912.....	41.51	44.99	43.21
1913.....	40.90	42.46	41.62
1921.....	43.69	45.85	44.71
1922.....	45.09	47.84	46.39
1923.....	46.33	50.24	48.21
1924.....	46.72	49.46	47.91
1925.....	49.02	52.53	50.74

Coincident, therefore, with the drop in the death rate first noted, there has been a very marked change in the average age of death, *which change has not been paralleled by a similar change in the age of the living.*

If we examine a little more closely the ages of those who died, we can trace wherein to quite an extent the change has taken place. The total number of deaths during the periods were 36,686 for the first period and 32,595 during the second. The ages at which death occurred may be tabulated into various age periods as has been done herewith.

Age Periods	1921–1925 Number	Per Cent	1908–1913 Number	Per Cent
0– 1.....	5,694	17.45	7,154	19.50
1– 9.....	2,206	6.58	3,666	9.95
10–19.....	1,319	4.05	1,972	5.37
20–39.....	3,604	11.09	5,065	13.82
40–59.....	4,329	13.29	4,369	11.90
60 and over.....	15,443	47.50	14,460	39.40
Total.....	32,595	100%	36,686	100%

There has, therefore, been quite a marked alteration in the percentages of deaths occurring in the different age periods. In the tabulation for the second five-year interval, there is a noticeably smaller percentage of death taking place in every age group up to the age of forty. The difference is perhaps most observable if we take the figures for the year 1925 alone, this being the most favourable of all the years.

Age Period	1925 Number of deaths	Percentage of total Mortality
0– 1.....	887	14.67
1– 9.....	334	5.53
10–19.....	262	4.33
20–39.....	627	10.37
40–59.....	843	13.92
60 and over.....	3,092	51.18
Total.....	6,045	100%

It will be seen that where, during the first period, of all persons dying 19 per cent were below the age of one year, and only 39 per cent were over sixty years of age, in the year 1925 the number of infants dying was only 14 per cent, whereas the deaths of those aged over sixty were over 50 per cent of the total mortality.

In the first period, the irregularity in the curve, arising from the number of deaths in the age group 20-39 being greater than those in the following age group, is attributable to the excessively high tuberculosis death rate, now quite rapidly falling. Over 2,000 of the 5,065 deaths occurring in this five year period were due to this cause.

Those familiar with life table construction will remember the figure which is called the "Probable Duration of Life," that is the age at which half of the life table population disappeared. A life table population usually commences with 100,000 persons, and follows them through till death has taken place. The age at which 50,000 have disappeared is the "Probable Duration of Life." If from a more detailed tabulation of the ages at death in the various years (not here given on account of lack of space), we endeavour to find for each year the age, on either side of which half the deaths occurred, it will be seen that these are as follows: (This may be called the central death age for want of a better term, and it will be noted how different it is from the figure given as the average age at which death occurred).

Year	Central Death Age Male	Female
1909.....	27	27
1910.....	39	41
1911.....	38	44
1912.....	43	47
1913.....	41	42
1921.....	49	51
1922.....	55	56
1923.....	54	58
1924.....	54	59
1925.....	59	62

The different provinces differ very widely in respect to this central death age. In one, where the general death rate is much lower than in Nova Scotia, the age at which half its females died was as low as sixteen for the year 1921 while for males it was only twelve. The Nova Scotian figures for the same year were fifty-one and forty-nine respectively.

For greater convenience in comparison the various figures for the five-year intervals are here given.

	Nova Scotia				
	1908–1913		*1921–1925*		
	Male	*Female*	*Male*	*Female*	
Expectation of life at birth.....	51.36	53.15	51.80	53.62	
Probable duration of life.....	62.01	64.14	62.97	64.71	
Average age at death.....	40.74	42.85	46.17	49.18	approx.
Central death age	37	40	54	57	approx.

The inadequacy of the general death rates to present a picture of the movements connected with the mortality occurring in a community is well exemplified in the above figures. With a drop in these death rates of but a few points, a very marked alteration has evidently been taking place in respect of the ages of those who are now being counted in the death returns. The average age of the decedent has increased about ten years from about forty-one to nearly fifty-one; the central age of death has moved up many years from twenty-seven to fifty-seven. The examination of the general death rates alone gives no intimation of the fact that such an alteration is in progress. Further, it permits of no measurement of the movement being made; nor does the process of standardizing the death rate help us. To a certain extent this process does not standardize the death rate; it standardizes the population. The factor of correction under this process has only altered one one-thousandth in the interval between 1911 and 1921. In 1911 it was 0.886; in 1921 it was 0.887; the standard in both years being the English standard million of 1881-90. *The age composition of the living population has not changed as materially as has the age composition of the numbers dying.*

The alteration must be considered as indicative of improvement. There are fewer deaths, which is itself an improvement, but of greater importance is the evidence that undoubtedly the deaths of the young and middle aged are being deferred.

[Ed. Note.—A comparison between the average age of the living and the average age of the dying in different calendar years does not permit of any conclusion being drawn regarding the changes in the mortality of the community unless the age distribution in the population continues approximately the same. The age distribution is, however, affected by the birth rate, by a high infantile mortality, by the number and age of those emigrating out of a district and the character of any immigration which may be going on. Assuming no unusual variation in these factors, the comparison may be considered as affording some indication of the general character of the mortality in different places, but we cannot draw positive conclusions therefrom. We have, much pleasure in publishing this article with the many new facts it brings forward.]

Investigation of Injuries from Hair Dyes, Dyed Furs and Cosmetics.—On the recommendation of the Section on Dermatology and Syphilology, the House of Delegates, in May, 1924, adopted a resolution calling for action to safeguard the public against injuries from dyed furs, hair dyes and cosmetics, and authorized the Board of Trustees to seek legislation if necessary to accomplish that end. The chairman of the section appointed a committee to co-operate with the Bureau of Legal Medicine and Legislation in carrying that resolution into effect. Harold N. Cole, Cleveland, chairman of the committee, makes the following report: There were 437 questionnaires distributed, and thus far only sixty-two have been returned. There were 144 cases reported in the sixty-two questionnaires returned from the physicians, and thirty-three additional ones reported by persons reading syndicated articles. One hundred and eleven reports of injuries from hair dyes were received. Paraphenylendiamine is present in at least nineteen of the forty-one hair dyes reported and probably in another, to say nothing of its being present in nine so-called "henna" cases. There were fifty-six reports from dyed clothing. Black is mentioned in seven of the seventeen instances in which colours were reported, and brown and red in three each. Here again, the paraphenylendiamine may well be the cause of the black and brown dermatitides. There were 137 reports of injuries from the various cosmetic nostrums. There were four definite reports from injuries due to bleaches, nine from cold creams, five from face powders, eight from rouge, and six from miscellaneous preparations. In the bleaches and cold creams, as analyzed and reported in the "Cosmetic Nostrums" a pamphlet of the American Medical Association, one notes the presence of mercuric chloride and ammoniated mercury as constituents in some of them. In the severe dermatitis resulting from the use of Mercolized Wax, the Bureau of Investigation reports that analyses have shown it to contain 10 per cent ammoniated mercury and 10 per cent zinc oxide as the main constituents. There were forty-three cases of injuries received from hair tonics. The principal happenings seem to have followed the use of Lucky Tiger, thirteen cases, and Mahdeen, two cases. Reports of injuries were received from the use of twenty-three miscellaneous preparations, comprising depilatories, mouth washes, orris root and toilet waters.—*J. Am. M. Ass.*, Feb. 5, 1927.

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A CASE OF MALIGNANCY IN A DERMOID CYST OF THE OVARY*

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An unmarried white female, aged fifty-one, was admitted to the Montreal General Hospital in May, 1925; (Hosp. No. 2373: service of Dr. H. M. Little). Her chief complaint was abdominal pain of which there had been repeated attacks during the preceding five weeks. The pain was not localized, was colicky in character, and the attacks, lasting one or two days, were associated with vomiting and constipation. There had been an appreciable loss of weight during the six months before admission to the hospital, yet at the same time the abdomen had become considerably swollen.

The family history was devoid of interest. The personal history disclosed the fact that the patient had always enjoyed good health in spite of an ever present tendency to constipation. The menstrual periods had not yet ceased and had always been regular, although for some time the amount of the flow had diminished.

A somewhat pale, well developed and fairly well nourished female, the patient proved on examination to be apparently normal, with the exception of what was found in the abdomen. The latter was obviously and uniformly distended; there was no visible peristalsis. Some tenderness was present in both lower quadrants, but no resistance or rigidity. A soft, apparently cystic tumour about the size of a cocoanut could be palpated above the symphysis of the pubis, and was dull on percussion and not particularly tender; no change in its size occurred after catheterization. Rectal examination revealed a few external hæmorrhoids, also a cystic tumour extending back into the hollow of the sacrum and practically filling the pelvis; this tumour gave definite ballottement. There had been no bowel movement for five days before admission, but an enema was quite effectual.

The case was regarded as one of intestinal obstruction due to the pressure of an ovarian cyst on the bowel, and an immediate laparotomy was accordingly performed. The left lower quadrant was found to be occupied by a tumour arising on the left side of the uterus; to this tumour the great omentum and a loop of ileum were adherent. The right side of the abdomen was filled by markedly distended ileum, the distension ending at the point of adhesion to the tumour. Cyst and bowel were with difficulty separated; the cyst was removed, and, owing to an evident partial obstruction of the lumen of the gut, about seven inches of the latter were resected.

The tumour, about the size of a cocoa nut, proved to be partly cystic and partly solid. The cystic portion occupied roughly two-thirds of

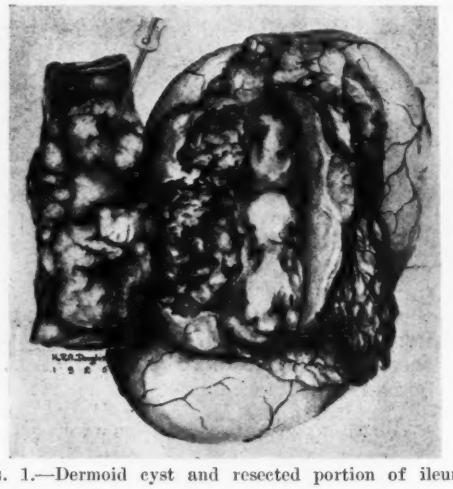

Fig. 1.—Dermoid cyst and resected portion of ileum.

the mass; its smooth surface was covered by peritoneum beneath which coursed numerous blood vessels. The walls of the cyst were very thin, with here and there a number of thickened areas. Internally, a layer of sebaceous material lined the cavity; removal of this material left a fairly smooth surface broken by discrete, irregularly shaped, elevated areas produced by thickenings in the wall. From one point on the inner surface of the wall, there hung by a narrow pedicle a round, thin-walled

* From the Pathological Department of the Montreal General Hospital.

cyst about an inch in diameter, and about the pedicle there grew a few scattered hairs. The cavity itself contained a thin, pus-like fluid in which a ball of hair was lying free. The individual hairs when extracted were seen to be quite long; while the majority were brownish in colour, a few were quite gray; sebaceous material served as cement to bind the mass.

The solid portion, which occupied about a third of the tumour, was very firm and nodular. The nodules varied considerably in size, the largest being raised about three quarters of an inch above the general surface. At one point the great omentum was adherent to, and seemed to fade gradually into the tumour substance. Close to the adherent omentum was a raw surface from which the bowel had been separated; this area of torn tissue measured one and a half by three inches. The inner surface of the solid mass helped to bound the cystic cavity. Covered with a moderately thin layer of sebaceous material, it appeared fairly smooth, but, upon removal of the latter, proved to be more uneven.

FIG. 2.—Cords of tumour cells invading and replacing the muscular coats of the bowel.

The resected portion of ileum presented, on the surface where it had been adherent to the ovarian tumour, two irregular, firm masses of tissue. The larger was in its centre hæmorrhagic and necrotic; the smaller showed in its centre an area of even more definite hæmorrhage and necrosis. Opposite each mass, and particularly opposite the larger, the lumen of the gut was considerably narrowed. After the bowel had been opened longitudinally, the larger mass could be seen bulging into the lumen, still covered with a somewhat thinned mucosa. Beside it, however, an opening in the mucosa led into an irregular cystic cavity scarcely half an inch wide. Opposite the smaller external mass, a nodule an inch in diameter bulged into the lumen of the bowel. In the centre of this nodule, loss of tissue had created an irregular opening which communicated directly with the area of hæmorrhage and necrosis already observed. The opening, as well as the lumen of the gut at this point, was filled with gelatinous blood-clot.

FIG. 3.—Tumour mass which has replaced the muscular coats of the bowel and caused ulceration of the mucosa.

The solid tumour, its continuation in the form of the two firm masses attached to the bowel, and the thickened areas in the wall of the cyst, all gave evidence macroscopically of being the same kind of tissue, and this was confirmed by microscopic sections. The latter showed cells resembling those seen in the deeper layers of the epidermis; the behaviour of these cells was in every way typical of a malignant growth. Solid cords grew wildly as in certain carcinomata of the skin. In some places their growth resulted in the formation of numerous pearls; in other parts were seen wide areas of necrosis. The attachment to the ileum was effected by a process of invasion and destruction of the normal tissues of the bowel with replacement by cords of tumour cells. This process could be seen to involve successively each layer of the gut wall, leading finally to obliteration of the mucosa.

The explanation of the patient's chief symptoms is fairly obvious. It would appear that

XUM

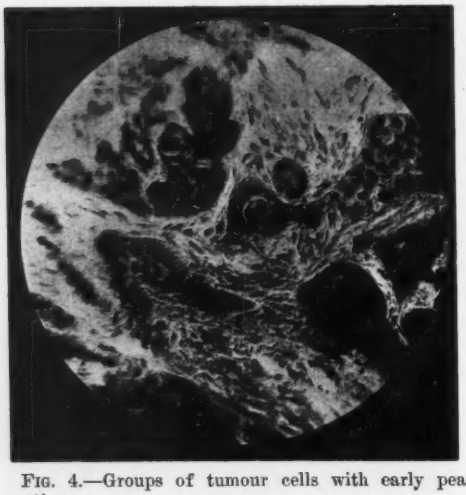

FIG. 4.—Groups of tumour cells with early pearl formation.

the growth, although present for a considerable period of time, rather suddenly took on a malignant character. During the benign stage, the patient was probably for a long time unaware of any abnormality apart from constipation possibly due to pressure of the tumour on the gut. Likewise during the malignant stage it is doubtful if any severe symptoms arose until the growth had mechanically caused, by invasion of the intestinal wall, a more pronounced obstruction. The lumen, already greatly reduced in size, was possibly completely obliterated by pressure of the tumour at the time of each attack of pain, vomiting and constipation during the five weeks preceding admission. The loss of weight with increase in girth would suggest that a chronic, incomplete obstruction had existed for several months.

SOME OBSERVATIONS ON "SADDLE-NOSE" DEFORMITY IN CHILDREN*

BY J. G. STRACHAN, M.D.

Toronto

THE correction of this type of nasal deformity in adults is a well recognized procedure. Many case reports and papers on the subject have appeared during the last ten years. Autogenous grafts of cartilage have been used, usually for restoring the bridge and tip support of the nose. Other materials such as heterogenous cartilage, bone, ivory and celluloid have also been utilized.

This deformity very often originates in early childhood. In considering measures for its correction the incomplete state of development of the facial skeleton is naturally thought of. No great change occurs in the size of the nose as a rule after the twelfth year. It is thought that rather than have the child subjected to the ridicule consequent on its deformity during very impressionable years it is better to operate though growth is incomplete.

My first case was operated on in 1922. Experiments were undertaken then to determine for myself the fate of transplanted cartilage. Using three months old dogs a portion of costal cartilage was obtained, denuded of perichondrium and planted in the dorsal muscles of the same dog. This procedure was repeated at the end of every month for four months. At the end of the fifth month the grafts were all recovered. Thus we obtained autogenous grafts of one month to five months old. It was found that they were firmly imbedded in the muscle tissue and not encysted. Sections from these grafts show the cartilage incorporated in fibrous tissue. There is no sign of degeneration, the cartilage cells appearing healthy. In the oldest graft there are bone cells showing that the graft had lived and matured.

The fact that the cartilage graft lives, grows and becomes incorporated in the tissues, and is elastic, would seem to favour its use instead of rigid foreign body grafts which might break,

* Read before the Academy of Medicine, Section of Otolaryngology, Toronto, March 8, 1926.

and being merely encysted might change their position.

FIG. 1.—Section of graft at end of five months. Note bone cells in area of deep staining. (Low magnification.)

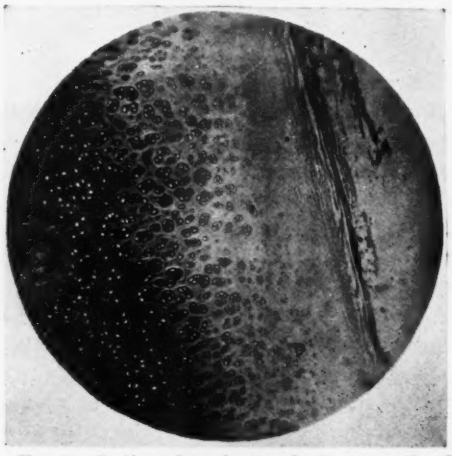

FIG. 2.—Section of graft at end of one month. The cartilage cells appear healthy. (High magnification.)

Etiology of the deformity:—

1. Congenital, *i.e.*, defective growth.

2. Traumatic. (1) Fracture of nasal bones with or without septal abscess; (2) Septal abscess; (3) Submucous resection. (An occasional occurrence the result of a too extensive removal of septal cartilage.)

3. Pathological. (1) Atrophic rhinitis; (2) Syphilis and tuberculosis.

A number of cases have presented themselves in the last five years complaining of a deformed nose. The commonest type of deformity observed was the depressed bony, bony-cartilaginous or cartilaginous bridge, *i.e.*, the saddle-nose. Sixteen such cases were submitted to operation. The cause of the deformity of the nose was noted as follows:

Defective growth	1
Compound fracture of nasal bones with septal abscess	1
After septal abscess alone	12
After submucous resection alone	0
Atrophic rhinitis and submucous resection	2
Total number of cases	16

Several cases of congenital syphilis presented themselves but were not suitable for operation.

FIG. 3.—1429, Marie Burke, nasal deformity, February 5, 1926.

FIG. 4.—1441, Marie Burke, correction of nasal deformity, February 11, 1926.

The average age of the patient operated upon was twelve years. *Operation.*—The technique adopted was a slight modification of that introduced by Mr. H. D. Gillies of London, England.

FIG. 5.—1562, Wm. Anderson, deformity of nose, August 6, 1926.

FIG. 6.—1626, Wm. Anderson, November 1, 1926.

Under ether anæsthesia a portion of cartilage of suitable size was obtained from the right eighth rib in the usual manner. A graft was then shaped for the bridge and if necessary a piece prepared for the support of the tip of the nose. These were placed in warm saline while the soft tissues were raised from the bridge and sides of the nose. A short transverse incision below the tip of the nose was made for the insertion of the elevating instruments. Extravasation of blood was prevented by keeping constant pressure on the nose while the grafts were being inserted.

In most cases it was necessary to insert a graft for the tip support. The small transverse wound was closed with dermal sutures and painted with compound tincture of benzoin. No dressing or splints were used.

Results.—With the exception of one case which died of an intercurrent infection, recovery was rapid and uneventful. Very little post-operative swelling occurred. In no case did infection of the grafts occur or did their position change. The chest wound healed uneventfully.

The average length of stay in hospital was eight days. The improvement in the appearance of the patients was very marked. They all expressed themselves as pleased with their "new nose."

Conclusion

The observation of these cases in some instances for a period of nearly five years and in the similar cases of Dr. Edmund Boyd for seven years has convinced us that:

1. The nasal deformity may be safely corrected while growth is incomplete. The grafts seem to encourage better development of the nose.

2. The grafts live, maintain their position and seem to grow, taking the place of the cartilage support lost for various reasons.

3. The improvement in the patient's appearance and the freedom from ridicule at a very impressionable age more than justifies the operation.

I wish to take this opportunity for thanking Dr. A. B. Le Mesurier and Dr. J. L. McDonald for procuring the cartilage for me, the Medical Research Committee for placing the facilities for the experiments at my disposal, and Dr. E. Boyd for valuable advice.

HEREDITARY ABNORMALITIES OF THE EYE

III. (Section 1) Anomalies of the Entire Eyeball*

By Madge Thurlow Macklin, M.D.,

From the Department of Anatomy of the University of Western Ontario Medical School, London, Ont.

ALTHOUGH the greater number of the inheritable defects of the eye concern one particular structure of the eyeball, such as the lens or iris, there are a few which involve the entire optic globe, either directly or indirectly. Such abnormalities are more apt to produce defective vision or total blindness than are some, at least, of those whose effects are more limited in scope.

Those defects of the entire eyeball which are hereditary include *cryptophthalmus*, which, because of its associated lid condition, was discussed in an earlier paper[8]†; *hypermetropia* and *myopia*, which will be reserved for that section dealing with errors of refraction; and *microphthalmus*, *hydrophthalmus* or *buphthalmus*, and *glaucoma*.

Microphthalmus is the defect in which the eyeball is so small that vision is subnormal or absent. There are probably many varying degrees of this defect, ranging from an eye, slightly reduced in size, down to mere microscopic remnants of eye tissue. To this latter class belong the so-called cases of anophthalmus, or total absence of the optic globe; it having been stated that in all cases of anophthalmus, microscopic examination of the orbital contents will reveal some trace of eye tissues. Only those cases of microphthalmus, which are sufficiently extreme to cause very defective vision or blindness are brought to the attention of the ophthalmologist. Most of the milder cases probably go undiagnosed.

This defect is congenital, and probably inherited in all cases. Due, however, to its being a recessive character in some families at least, the hereditary aspect may be overlooked. Thus Westcott[17] reports a family in which the parents were healthy, and in whose ancestors there had been no history of microphthalmus. The two children born to these parents were blind at birth, due to the presence of microphthalmic eyes. Gallenmaerts[4] records the history of a family, in which the father was normal, the mother had a high grade myopia on the left side; and of the three children, one was normal, one exhibited microphthalmus on the right side and anophthalmus on the left; and the third showed a bilateral anophthalmus. Ryan's[13] case was the offspring of parents who were cousins, neither of whom showed any anomaly of the eye. The child was born without any macroscopic trace of either eye.

McMillan[9] gives the history of a family, in which from healthy parents, four children affected with microphthalmus were born.

Other records, which show the occurrence of microphthalmus in more than one child of healthy parents are those of von Stuelp,[3] who records eight of fourteen affected; Bruns[3] whose pedigree showed three of seven with the defect, and von Hippel,[3] who reports three of ten offspring blind with microphthalmus.

On the other hand there have been some families reported in which the affliction was not transmitted by those who were free from it and in which the affected members passed it on to some of their offspring. Usher[16] gives a pedigree, in which microphthalmus was associated with myopia and corectopia through four generations. The first member in the pedigree had five normal children, who between them had sixteen children and twenty-six grandchildren, all normal. He had also two microphthalmic offspring, who inherited his

* Part I, Laws of heredity and their exemplification in the inheritance of eye colour, *Canad. M. Ass. J.*, Nov., 1926, xvi, 1340. Part II, Inheritable defects involving the eyelids and their mode of transmission, *Canad. M. Ass. J.*, Jan., 1927, xvii, 55.

† The bibliography referred to will follow in Section 2.

defect, and who in turn passed it on to their offspring, and to their grandchildren. Thus, in this family, the mode of transmission was in the direct manner, as opposed to the indirect, in the pedigrees just mentioned.

The first group of cases showing indirect inheritance may all be explained by referring to Table 1,[7] Mating VI.* Microphthalmia in these families is similar to blue eye colour in its mode of transmission. Two normal parents, both of whom carry the recessive factor for microphthalmus latent, mate and the two recessive factors, meeting in one individual, produce microphthalmus.

In the family reported by Usher, the factor for the defective development seems to be dominant and the matings in this pedigree would then resemble Mating V, Table 1, where a normal person, carrying two recessive factors for normal eyes, was mated to a defective individual who carried a recessive factor for normal eyes and the dominant factor for microphthalmus. That the factor for a certain condition may be dominant in one family and recessive in another seems to be supported by the pedigrees of this as well as other diseases. It may be that the outward manifestation of the disease is the same in the different families, while the underlying pathology may be dissimilar, thus accounting for the two differing modes of transmission. Another possibility may be present, and that is, that there may exist not only qualitative but quantitative differences between defect and normality on the one hand, but also between two normals or two defectives. Thus a defect, which is sufficiently strong to overshadow the factor for normality in one family, acts as a dominant character; but the same defect, present in another family, where the factor for normality may be quantitatively stronger, is unable to assert itself, and so becomes recessive.

The pedigree shown in Fig. 6 taken from Ash,[1] represents another type of transmission in microphthalmus. Heretofore the various defects discussed in the second paper of this series,[8] have been transmitted from fathers to sons and daughters, and from mothers to daughters and sons; in other words either sex has transmitted equally to both sexes. We now come upon a new type of transmission, the so-called sex-linked transmission. We see at a glance that only the males are affected, and that the parent who belongs to the affected family is in each instance the mother (with the exception of the two males in the second generation, there being no direct evidence to show that their mother was the person who transmitted the defect to them.) Here then we have healthy mothers transmitting to their sons a defect which their own brothers showed. How can such a mode of transmission be explained, and can any formula be evolved that will show which individuals are apt to be affected?

If we understand that sex is inherited like any other quality, such as eye colour, and that the female has two sex chromosomes, while the male has only one, we can, by tabulating the various matings, show how such sex-linked characters can occur.

Since there are two sex chromosomes in the female, the maturation of the ovum results in two cells, both of which contain a sex chromosome; but in the male, the sperm cells which contain only one sex chromosome, are unlike after maturation; since the single sex chromosome is indivisible and must go into either one or the other of the mature sperm. Hence spermatozoa of the human male, (and this is true of many other forms as well), are of two classes; those with and those without the sex chromosome. If we now designate the sex chromosome by the letter X, we can show schematically how the male inherits his one sex chromosome from his mother, and how the female receives her two sex chromosomes from both parents. If we represent all the remaining chromosomes, not concerned in the transmission of sex by the symbol, 2A, the female is designated as follows: 2A+2X, while the male is designated by 2A+X. When the ova and the sperm undergo maturation, half of the chromosomes go into the germ cell that is to be used in fertilization, and the remaining half are discarded. Hence we have the following scheme:

2A+2X on maturation becomes A+X.
2A+X " " " either A+X or A.

Depending upon which sperm cell fertilizes the ovum, we have the two results,

* *Canad. M. Ass. J.*, Nov., 1926, xvi, 1341.

A+X (ovum)	A+X (ovum)
A (sperm)	A+X (sperm)
2A+X (male)	2A+2X (female)

Thus the one sex chromosome which is present in the male is the one inherited from his mother. As soon as the sperm containing the sex chromosome fertilizes the ovum, the full number of sex chromosomes is made up, and the individual is a female.

We must now understand that any one chromosome contains the hereditary factors for many differing conditions in the individual, and that as a usual thing this chromosome is passed on like a sealed packet with all that it contains from individual to individual. Hence when the chromosome for the determination of sex is passed on to the next generation, all the other qualities that it contains, go with it. Some of the *abnormal* factors which this chromosome may contain, in addition to the factor for sex, are hæmophilia, optic atrophy, colour blindness, and (in this family reported by Ash), microphthalmus. If we now designate by X the chromosome which carries the factor for sex, but none for abnormal eyes, and by x, the sex chromosome which carries in addition, the recessive factor for microphthalmus, we can express as has been done in Table 2, all the possible varieties of mating. If we remember that microphthalmus, in this pedigree, is recessive like blue eye colour, and can only be exhibited when there is no dominant factor for normal eyes to overshadow it, we can see how the male, having but one sex chromosome, in which is lodged the defect, can show the condition, since there is no second sex chromosome carrying a factor for normality to inhibit its appearance. The female on the other hand, through possession of two sex chromosomes, is normal, for the factor for normality in one sex chromosome overshadows the factor for microphthalmus present in the other. She is like the brown eyed hybrid (Table 1 *loc. cit.*), who shows brown eye colour, even though she carries the factor for blue latent, and may transmit it.

Stating in general terms what has been tabulated above, we may formulate certain rules that may help in the interpretation of

TABLE 2

SHOWING THE INHERITANCE OF SEX-LINKED RECESSIVE CHARACTERS

	Parents		Offspring	
Mating	*Female*	*Male*	*Female*	*Male*
VII	XX (normal	X (normal)	XX (normal)	X (normal)
VIII	XX (normal)	x (microphthalmus)	Xx (normal, but carriers)	X (normal)
IX	Xx (normal, but carrier)	X (normal)	XX (normal)	X (normal)
			Xx (normal, but carriers)	x (microphthalmus)
X	Xx (normal, but carrier)	x (microphthalmus)	Xx (normal, but carriers)	X (normal)
			xx (microphthalmus)	x (microphthalmus)
XI	xx (microphthalmus)	X (normal)	Xx (normal, but carriers)	x (microphthalmus)
XII	xx (microphthalmus)	x (microphthalmus)	xx (microphthalmus)	x (microphthalmus)

X and x represent sex chromosomes
XX a female
X a male
X a normal chromosome for sex, lacking in the factor for microphthalmus
x a sex chromosome which also carries factor for microphthalmus
X or normality is dominant to x or microphthalmus

this, as well as of other sex-linked recessive characters.

1. A man afflicted with a sex-linked recessive character will have no children showing this abnormality, provided that he marries a woman who is normal, and is not a carrier, (see Mating VIII, Table 2).

2. The sons of such a man will not only be normal, but they cannot transmit the defect to their descendants. (Mating VIII).

3. The daughters of such a man will be outwardly normal, but they will *all* be carriers of the defect, (Mating VIII) liable to give it as an evident abnormality to half their sons. Mating IX).

4. Half the daughters of a woman who is a carrier are apt to be carriers themselves, transmitting the defect as their mothers did, to half the sons as an evident defect and to half their daughters who will be carriers in their turn. (Mating IX).

5. It is possible for a woman to show a sex-linked recessive character, (although this has sometimes been denied) but to do so, she must have had a father who showed the abnormality, and a mother who was either a carrier or who had the defect, (Matings X, XII).

6. All the sons of a woman who shows a sex-linked recessive defect must themselves show that defect. (Matings XI, XII.)

7. The only members of a family in which there runs a sex-linked recessive defect who can marry with impunity are the unaffected males and their descendants. Such unions will result in offspring without the defect in question, provided always that the mate in each case does not carry the defect either evident or latent.

8. All the daughters of affected fathers are carriers and should refrain from reproducing. As a matter of fact all females in a family in which the sex-linked recessive character runs, should refrain from having children, if the defect in question is a serious one, such as microphthalmus, optic atrophy, or retinitis pigmentosa, all of which are apt to produce blindness. Such a rule will prevent normal women from marrying, but it is impossible to tell which are normal, and which are carriers, until they have reproduced, when it is too late to prevent the transmission of the defect.

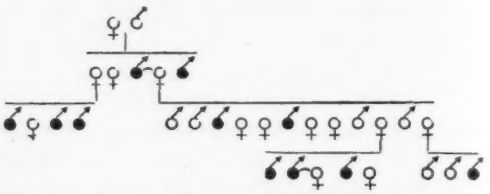

FIG. 6.—Pedigree of microphthalmus, after Ash. Circles with arrows indicate males; circles with crosses indicate females. ∩ indicates twins. Note that only the males are affected, and that the females have transmitted it, although they have not exhibited it. Black symbols show the affected members.

If we now examine the pedigree in Fig. 6 we see how uniformly the inheritance of microphthalmus runs in this family. It must be assumed that the mother in the first generation was a carrier, since two of her sons showed the defect. The daughters were free of it, yet the two daughters who married passed on the condition, in one case to all three of her sons; in the other, to two of her six sons. In no case were the females affected. In the fourth generation there are three sons in one family and one in the other who inherited the defect which had been caried latent through three generations at least of females, it having come down through their great grandmother, their grandmother and their mothers, without having once affected the carrier. It is readily understood how a sex-linked recessive defect might descend through many generations of females, and if the families were small, and the males had chanced not to inherit the defect, it might appear that a son who showed the abnormality was a sporadic case. In reality it would be inherited, but the heredity would not be obvious.

In passing, it might be mentioned that this pedigree shows the tendency to twinning in families. The woman in the third generation that had twins was herself the daughter of a twin. It will be noticed too that in each case the twins were of opposite sexes, and that the tendency to twinning was inherited through the mother's side of the family. It seems to be a fairly constant rule that if the tendency to twinning is inherited from the father's side of the family, the twins will be of the same sex and identical in appearance. If the inheritance is on the maternal side, the twins may or may not be of the same sex and they need not be identical in appearance, even if of the same sex.

In summing up the inheritance in microphthalmus, it may be said that a condition which is diagnosed under that name may apparently be inherited either as a recessive, a dominant, or a sex-linked recessive condition. In any case the person so afflicted should not reproduce, but it would depend upon an investigation of the family history as to the advice to be given to the brothers and sisters of the afflicted individual. Parents who have produced one microphthalmic child should of course have no more offspring.

(To be continued)

THE TREATMENT OF EARLY MALIGNANCY OF THE LARYNX BY ELECTRO-DESICCATION AND RADIUM

By Robert H. Craig, M.D.,

Montreal

THE study of malignant disease, especially laryngeal carcinoma, has always deeply interested me. The late Sir Felix Semon, Sir St. Clair Thomson and other British surgeons, have had comparatively satisfactory results in dealing with early malignancy of the larynx, by laryngofissure. On the American continent on the other hand, laryngectomy is the operation of choice according to the views expressed by some of the leading authorities in this work.

My experience, however, has brought me to a different conclusion. For more than twelve years I have used electro-desiccation as a means of destroying malignant growths of the lips, mouth, tongue, pharynx and larynx, and for the past five years, preparatory to destroying such growths, my patients are given deep x-ray therapy. I use radium almost entirely as a post-operative measure in these cases, for we know that it has a selective softening influence upon all scar tissue.

Before adopting electro-desiccation as a means of destroying malignant laryngeal growths, the results obtained were very disappointing in their final outcome. Inspired by the work in electro-desiccation of William L. Clark of Philadelphia, I determined to apply his methods in my own field, and the results up to the present have been highly gratifying. A citation of one or two cases may prove of interest:

Case 1.—Male, fifty-two years of age, referred to me by the late Dr. T. Passmore Berens of New York City, with a husky voice of two months' duration. Examination revealed a diffuse infiltrating growth involving the left vocal cord and encroaching upon the ventricle of the larynx and left vocal process. Wassermann was negative. Anti-luetic treatment, however, was given for a period of six weeks before definitely deciding to operate. A few days before operation the patient consulted in company with Dr. Berens, a leading laryngologist of this city, who confirmed my opinion as to the absolute necessity for operation. Under chloroform anæsthesia a high tracheotomy was performed and the larynx split open. The growth was found as described above and removed by the high frequency knife. Biopsy showed the growth to be a squamous cell epithelioma. The tracheotomy tube was not removed for a week following operation. Convalescence was delayed in this case owing to sloughing of the left wing of the thyroid. It is now well over five years since the operation, and there is no sign of a recurrence. The patient has lately written me that he has never enjoyed better health. His voice is husky, but he can be heard on the telephone and has no difficulty in attending to multifarious duties incident to his position as manager of a large corporation.

Case 2.—Male, sixty years of age consulted me November, 1925 regarding a husky voice of two months' duration, following an attack of influenza. Examination revealed an uneven fringe-like growth involving the anterior two-thirds of the left vocal cord, slightly ulcerated in its centre. Wassermann was negative but patient was given the benefit of the therapeutic test, which is a routine procedure with me. Four weeks later the appearance of the growth showed no improvement, and I conferred with Dr. Birkett who agreed with me as to its nature. Under general anæsthesia I desiccated the growth by the direct method and three weeks later when the reaction had subsided he was given a gamma radiation externally, followed two weeks later by intra-laryngeal radiation, using the Yonkauer tube. Two more gamma radiations were given. In all he had 2,500 milligram hours radiation. This patient had prolonged periods of vomiting, nausea and general malaise after each radiation. At present his voice is normal and the cords present a normal appearance. He is enjoying excellent health.

These cases with some others, were presented before some members of the Laryngological

Section of the American College of Surgeons, at the last meeting held in Montreal.

When the growth is limited to the vocal cord as shown in Fig. I, I find it can be completely destroyed by electro-desiccation through the laryngeal speculum. In Fig. II where the ventricle and false cords are involved, it is necessary to split the larynx open to obtain a complete and satisfactory exposure of the growth. In Fig. III where the growth has encroached upon the arytenoid cartilage, and the posterior third of the larynx, laryngectomy is the operation of choice, but even here electro-desiccation may be tried.

Fig. I

Fig. II

Fig. III

In summing up the advantages of this method the following considerations seem to me of paramount importance. Given an apparent case of cancer, I do not think the surgeon is justified either before or after the therapeutic test for syphilis, in removing a section for microscopic examination. This procedure sometimes results in metastases and the growth in any case has to be dealt with. The satisfaction of an absolute diagnosis is in my opinion not worth the risk to the patient, provided that lues and tuberculosis have been excluded.

By excising the growth well into healthy tissue by the high frequency knife, the blood and lymphatic channels are completely sealed and hæmorrhage and metastases prevented. The main points to be emphasized are the necessity for the complete removal of all diseased tissue, to be followed by the powerful sparking of the underlying tissues.

I have no confidence in the efficiency of radium needles or radium seeds implanted in the larynx, preferring electro-desiccation, as it does not devitalize the surrounding tissue. When the reaction following desiccation subsides, deep gamma radiation intra- and extra-laryngeally should be given. Should these measures prove unsuccessful in combating the disease it is always possible to resort to laryngectomy, but who would wish to go through life with the trachea stitched to the skin if it could possibly be avoided. An optimistic attitude, sunlight, fresh air and a happy environment are incalculable aids in the successful treatment of laryngeal carcinoma. In all late cases it is useless to waste time with palliative measures and laryngectomy should be done at once.

Dr. A. J. Grant in a paper read before the Harvey Club of London, Ontario, on subdeltoid bursitis says: Subdeltoid bursitis is one of the most frequent causes of a "lame shoulder" popularly diagnosed as a sprain or "a touch of rheumatism." Codman of Boston in 1906 was among the first to draw the attention of the profession to the fact that there were definite pathological changes associated with this condition, such as a deposit of lime salts, a localized necrosis, granulation tissue and inflammatory thickening of the bursa. No other part of the body shows such early calcification, often as early as two weeks. Calcareous deposit may however, be absent. Bursitis is always associated with traumatism and is often the result of a fall upon the outstretched hand, elbow or shoulder, or of cranking a car or throwing a baseball. Infection and toxæmia are not etiological factors. The pain may be local or referred to other parts of the body, but is often worse at night. A tenderness over the bursa is a fairly constant sign. There is a limitation of voluntary abduction and internal rotation. The x-ray frequently shows some calcification. Medicinal treatment has not been very satisfactory, and operative interference has been rather freely advised. The clinical histories of seven cases were given. All of the patients made a complete recovery in six to eight weeks following diathermy and massage.

Case Reports

REPORT OF A CASE OF HYDROPS NEONATORUM

By Wm. J. Stevens, M.D., C.M.

Ottawa

Hydrops neonatorum, or general anasarca of the fœtus is a rare condition, and the fact that its etiology is very obscure makes a report of the present case one of more than passing interest. Several theories regarding the cause of it have been advanced, but nothing definite has been determined. The primary cause has been sought in some vascular disturbance, or disease of the mother, father, fœtus, or placenta. Disease in the mother is at present considered to have the most definite relationship to the cause of the condition. In my case the mother showed evidence of a slight nephritic toxæmia which tends to bear out this supposition, but the fact that the cord was partially prolapsed also looms up as a possible cause. I report the following fœtal monstrosity in which this very unusual condition was present, giving rise to marked dystocia, the degree of which could not be appreciated, until traction was applied to the head.

The patient, a primipara, aged thirty years, was of a bright, somewhat nervous temperament, and had been married two years. There was no previous history of scarlatina, diphtheria, tonsillitis, nor rheumatism. Menstruation began at fifteen years, it was always somewhat irregular, with intervals of from one month to six weeks, flowing moderately from five to ten days. The last period was on October 28, 1925, so that her expected confinement was August 4, 1926. *On April 7, 1926*, an examination was made: external pelvimetry showed the pelvis to be of normal size. Interspinous measurement was 22 c.m.; the external conjugate was 27 c.m.; the internal conjugate was 19; the left obligate 22.5 c.m.; the right obligate 22 c.m. The true conjugate diameter was of sufficient length; the transverse was also normal. Blood pressure at this time was, systolic 110; diastolic 60. Urine appeared normal; specific gravity 1,018, acid, no albumen, no sugar, no casts. The height of fundus suggested a five month fœtus. Life had been felt two weeks previously. There was nothing at this time to suggest anything unusual to be pending.

Previous to May 19, 1926, patient pursued a normal course. On this date the blood pressure was, systolic 120; diastolic 60. The urine showed a trace of albumen. There was also some œdema of the hands and feet. The urine was examined at regular intervals, and never showed more than a trace of albumen; the blood pressure varied from 124/80 to 120/69, and the patient was advised accordingly.

On June 30, 1926, labour pains commenced. Abdominal examination revealed a vertex left occipital anterior position; fœtal heart to left and below. Pains were strong, every ten minutes. The cervix was dilated to admit one finger. She entered hospital at 10 a.m. with slight œdema of lower extremities. During the day the patient made slow progress. At 1.30 p.m. dilatation was to the extent of one and a half fingers, at 8.30 p.m. to that of four fingers. At 9.45 fœtal heart was 136.

On July 1, 1926, at 12.05 a.m. the fenestrated blades were applied to a partially engaged head in the left occipital anterior position with "cord threatening to prolapse." Absolutely no progress could be made by traction, so it was deemed better, on account of the fœtal heart being heard, to resort to Cæsarean section, which was done at

1 a.m. (Patient later left the hospital in good condition).

The fœtus was 48 cm. long, weighed nine pounds eight ounces, male. Scrotum only was quite cyanotic at birth. It did not breathe. There was no maceration. As the accompanying x-ray photograph shows, the fœtus was extremely œdematous throughout its whole body. The head and softer tissues of the neck were, comparatively speaking, enormous and certainly prevented any possibility of the fœtus being delivered *per vaginam*. The tissues of the body and extremities were extremely large, rounded, firm, and brawny. Autopsy was undesired. Placenta and cord were normal. Altogether, the appearance of the fœtus was a most unusual one.

There are only a few cases of true general fœtal œdema to be found in the literature. This case may have been due to "pressure on the cord," or as the result of a maternal nephritic toxæmia of mild character the assumption of that obscure theory being, that maternal toxins passed into the fœtal circulation.

REPORTS OF THREE CASES OF INJURY TO THE RIGHT KNEE

By George M. White, M.D.

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These cases are of interest, inasmuch as the injury in each case was in the region of the right knee. Case 1: fractured patella; case 2: torn patellar ligament; and case 3: torn quadriceps tendon; thus making a complete series. The patients were all in the seventh decade of life, and two of them weighed over 200 pounds. All three were treated in the same way, with uniformly good results.

Case 1.—M. C., female, age sixty-two years, admitted August 25, 1925. *History.*—On August 13, 1925, she was kicked on the right knee by a horse. The knee was very painful and swollen at the time, and she had complete loss of function. The swelling gradually subsided, but an attempt to move the knee was still painful and she had persistent loss of ability to extend her knee, or to bear any weight on it. The personal and family history was negative.

General examination.—A fairly well nourished white female. Weight 155 pounds. Colour good. Respiratory system negative. Some arteriosclerosis. Blood pressure, systolic 150; diastolic 88. Examination otherwise negative.

Local condition.—The right knee was swollen and tender. The tenderness was localized over two areas. Just above the insertion of the patellar ligament was a hard mass which was tender, and over the patella itself pressure caused pain.

X-ray report.—Fracture of the right patella in its lower fourth. On August 26, 1925, a crescentic incision was made over the lower border of the patella, which was found fractured in its lower quarter. A large blood clot was cleaned out from between the fragments. Three holes were bored through the margin of each fragment, and by means of sutures of chronic catgut the fragments were drawn as close together as possible. The wound was closed, and a plaster cast applied. On September 6th, a window was cut in the plaster, and the skin sutures removed. The wound was clean. On September 9th, she was discharged. She wore the plaster cast for six weeks, then it was removed, and a lighter one put on for two weeks. During the winter her knee was quite stiff, but about the first of June she was able to bend it slightly. She now walks about almost perfectly on a level surface, although her right leg is not as strong as her left. She has not been able yet to put her right foot ahead going upstairs. The result must be regarded as very favourable for a person of her age.

Case 2.—R. G., female, age sixty-one years, admitted November 8, 1925. *History.*—On November 7th, while crossing the street, she was knocked down by an automobile. She was bruised about the shoulder, but her worst injury was her right knee, which was swollen, tender, painful, and she could not extend her leg.

General examination.—The patient was a very large, obese woman, weighing 210 pounds. On admission she was suffering from generalized bruising of her whole body; both shoulders had large areas of ecchymosis. Her physical examination showed only some emphysema, and a slightly enlarged heart, with a low blood pressure, systolic 90, diastolic 60.

Local condition.—There were several bruises on the inside of the right thigh. Her right knee was swollen and tender. She had no power of extension of the right leg, and the right patella was abnormally mobile, and was found lateral to its normal position, with localized tenderness over its lower edge.

X-ray report.—The right patella was seen dislocated outward, suggesting a torn patellar ligament.

On November 14th, at the operation, it was

found that the whole internal lateral ligament, with the inner side of the capsule and the ligamentum patellæ, was completely torn across. The portion of the capsule external to the patellar ligament was intact. The torn portions were sutured with chromic catgut. The attachment of the capsule to the tibia was very short and much frayed out, so that it was difficult to suture the upper leaf to the lower, which in some instances seemed torn off at its attachment to the tibia. The wound was closed and a plaster cast applied. On November 25th, the plaster was removed, sutures were taken out, and the plaster re-applied. On December 3rd, the plaster was again removed and a lighter cast applied. January 5th, a knee brace of leather reinforced with steel ribs, was made and put on in place of the plaster. She was allowed to stand her full weight on her feet. She gradually began to walk a few steps increasing the amount each day, so that by the end of January she was discharged, walking with a cane and the knee brace. She was asked to endeavour and bend the knee every evening on removing the brace. She wore the brace until about May 1st, when she discarded it. She is now able to walk about. She has full power of extension of the right knee, but it is not as strong as the left, as she has never been able to put the right foot ahead going upstairs; the knee is swollen and gets tired easily. However, when we remember she is sixty-one years old and weighs 210 pounds, the result must be regarded as satisfactory.

Case 3.—J. N., male, age sixty-nine, admitted January 7, 1926. *History.*—On October 15, 1925, while riding in a high wagon, the left foot and leg went through the bottom of the wagon and so his whole weight suddenly came on the right leg, which was flexed at the knee. At the time, he experienced severe pain just above the right patella, and was not able to use the leg in any way. On attempting to rise, he had a second fall which injured his knee still more. A plaster cast was put on and left for two weeks, then changed and a second plaster cast left for five weeks. On removing this he found the same loss of power in it as before.

General examination.—A very large man, weight 220 pounds, muscular and well nourished. System negative, except for a chronic bronchitis and some enlargement of the heart. Heart function good.

Local condition.—Patella was seen to be lower than normal and pulled to the outer side, and tenderness on pressure at its upper margin existed. On attempting to extend the knee, the quadriceps tendon on the outer side could be felt to tighten, but above the rest of the patella it could not be felt. A mass about the size of a walnut, about one and a half inches above the patella could be felt at this time.

X-ray report.—No evidence of any fracture or dislocation of the right femur, tibia, or fibula. Patella appears to be lower than normal. A diagnosis of rupture of the quadriceps tendon was made, and it was considered that this was not complete as the outer side of the tendon seemed to be present. On January 9, 1926, the sheath was opened and the tendon was found torn away from the upper border of the patella. Two holes were bored in the upper border of the patella and two strong chromic catgut ligatures were put through and sutured through the quadriceps tendon, taking a good bite. The torn ends of the tendon were then sewn together with chromic catgut, and the wound closed. Living sutures were considered here, but owing to the age and condition of the patient an anæsthetic as short as possible was desired. After closing the wound a plaster cast was applied. On January 20th, this was removed, the skin sutures taken out and the plaster re-applied. The patient was sent home after a week. In April, the patient came back and had the plaster removed. The wound was well healed. Very gentle passive movements of the knee gave no evidence of the tendon. A leather knee brace reinforced with iron ribs was made and given to the patient to wear while walking. This was worn when he walked about and was removed at night and movements, gentle at first but gradually to be increased were ordered. About January 1st, this was discarded. By the middle of October, he was able to go upstairs, putting the right foot alternately ahead of the left, and lifting his whole weight on that leg. The function was so nearly perfect that he was able to follow the plough during the month of October.

The injury in each of these cases was of disabling nature, and in each case affected a different kind of tissue. Yet all three were repaired by simple surgical methods, with no special apparatus; strong chromic catgut was used to hold the parts; this with a sane after-treatment gave the satisfactory results here reported.

These three cases were treated in the service of Dr. F. E. McKenty in the Royal Victoria Hospital.

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GENERALIZED NON-TRAUMATIC SUBCUTANEOUS EMPHYSEMA*

With Report of a Case in a Young Child

By Max. W. Bloomberg, M.D.,

Montreal

The escape of air into the subcutaneous tissues is a frequent occurrence following severe injuries, especially those of the chest. This condition, however, has often been observed where there has been no previous injury, usually as the result of pathological changes in the respiratory tract. These may be considered in two groups, namely those resulting from tuberculous, and those from non-tuberculous cases. It is with the latter type that this paper is concerned.

On attempting to classify the non-tuberculous "non-traumatic" types of subcutaneous emphysema a difficulty at once becomes apparent. Since the escape of air into the tissues is in nearly every instance preceded by violent coughing, or as in parturient women, by violent straining, the question arises whether these should be considered "traumatic," because they are due to violence, or whether this term should be confined to those instances where the violence is external, and the result of an external injury. It seems more reasonable to adopt the latter view.

Furthermore, by analogy to pneumothorax one is tempted to employ the term "spontaneous" emphysema for these cases. However, since there are those[1] who under this head refer to the type of case in which the presence of air in the tissues is the result of decomposition of a hæmatoma (Velpeau's theory), it seemed advisable to adopt the term "non-traumatic" to designate the cases in which the escape of air into the tissues is not due to external violence.

The following classification of these may be made:

1. Congenital emphysema. This appears at birth or shortly after. It is rare and few cases are on record.[2]

2. Emphysema occurring during labour,[3] usually in the second stage and due to the raising of the intra-pulmonary pressure by excessive straining.

3. Spontaneous emphysema, already referred to.

4. Infective emphysema, from infection by gas-forming organisms.

5. Emphysema resulting from ulceration, as may occur in untreated laryngeal diphtheria,[4] or from erosion by a foreign body.[5] (Really traumatic, but included since the condition is the result of ulceration and not violence.)

6. Emphysema following pulmonary disease, in which there is excessive coughing, as in pneumonia, or pertussis.

The *diagnosis* is easy. The air usually appears first in the supra-clavicular spaces and thence extends to other parts of the body. The extent varies greatly but the scalp, palms of the hands and soles of the feet rarely are involved. Instances where the emphysema is generalized are infrequent and extremely uncommon in children. For this reason the following case was deemed of interest.

H. S., a white male, aged three years, was admitted to the Children's Memorial Hospital, May 27, 1925, with the complaints of cough, fever, and vomiting, of five days' duration.

Personal history.—Had pneumonia at the age of two months and also at twenty months. Measles six weeks before admission. Had been treated in the out-patient department for asthma and chronic bronchitis.

Examination revealed a poorly nourished child suffering from dyspnœa and cough. Labial herpes was present. Temperature was 102° F.; pulse, 160; respirations, 48. There were a few enlarged cervical glands and the tonsils were hypertrophied. The heart was normal. Examination of the lungs showed slight dullness at the left base posteriorly. The breathing was harsh and vesicular in character with prolonged expiration. Numerous sibilant and sonorous râles were present throughout both lungs, as well as a few moist râles at the left base. There was increased intensity of the voice sounds over the upper part of the right lower lobe behind. A diagnosis was made of asthma and probable bronchopneumonia. The following day there appeared a puffiness of the neck and of the left side of the face. On palpation this was revealed as

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air in the subcutaneous tissues. On further examination this was found to extend down both arms to the wrists, and into the axilla and around to the back. There was no pneumothorax made out and the roentgenograph confirmed this. By the next day the emphysema had extended down the abdomen to the groins.

The leukocytes numbered 11,200. The von Pirquet test was negative on several occasions. The Mantoux test was also negative up to 1 mg. of tuberculin. The emphysema disappeared in about two weeks; the fever lasted about ten days, subsiding gradually.

The child returned to the outdoor clinic ten days after discharge with an acute asthmatic attack. It was discovered that the house cat was the factor exciting these attacks.

Comment.—Many theories are presented to explain the manner in which the air gains access to the tissues, most writers agreeing that the process is a mechanical one. Berkeley and Coffen[8] suggest that the origin is from a ruptured air sac and the course along the blood-vessels to the mediastinum. Alexander and Follett[7] maintain that violent exertion or coughing causes a rupture of pulmonary vesicles allowing the escape of air into the interlobular or interlobar spaces from which it extends to the mediastinum and thence to the rest of the body. Meyer and Lucke[8] present two theories. First is an ingenious one that chemical changes take place in the blood allowing diffusion of air through the walls of the alveoli into the interstitial tissues. Their second theory holds that the air escapes through an ulcerated or eroded surface in the bronchi and passes *via* peribronchial or perivascular channels to the mediastinum. All endeavour to support their views by necropsy specimens.

A striking point brought out by Meyer and Lucke is, as a rule, the absence of concurrent pneumothorax, although this was present in two of eleven cases studied by Berkeley and Coffen. These observers suggest that subcutaneous emphysema may occur through the intra-pleural route provided that adhesions exist between the two layers of pleura at the point of rupture, as is most common, or through the extra-pleural route if the air dissects its way to the hilum of the lung along the blood-vessels.

In support of the mechanical theory are the numerous references in the literature to instances of emphysema occurring during labour.[3] The condition was frequently noted as a complication of influenzal pneumonia during the recent pandemic,[9] and as this disease was characterized by intense inflammation and ulceration of the bronchial tract those who observed these cases believed that ulceration or erosion of a small bronchus was the method of access of air to the tissues. This does not, however, explain the frequent occurrence of interstitial emphysema in parturients, or in conditions other than influenzal.

Our own view is that in these cases there is a pre-existing weakness of either the alveolar or bronchial walls. The strain of excessive and *prolonged* coughing such as is frequently met with in pneumonia and in pertussis, resulting in a greatly increased intra-pulmonary pressure, causes a rupture at a weakened point and allows subsequent escape of air into the subpleural tissues until it reaches the root of the lung. Thus ulceration of the bronchi in the influenzal pneumonia cases is only a predisposing cause, the strain produced by severe and prolonged coughing accompanying the pneumonia being the exciting cause. This is in agreement with the views of Clark and Synnott[10] who concluded that the origin of the gas was from weakened alveoli of the lung under pressure.

In the case herein described the pre-existing asthma had evidently caused a thinning of the alveolar wall, which gave way under the strain of the excessive coughing occasioned by the pneumonic infection. The weakened alveoli seemed able to resist the effects of ordinary violent coughing, but when this is prolonged as in pertussis or pneumonio they apparently give way. Similarly during labour the strain is an unusual and prolonged one.

Treatment is palliative; ordinarily the air is absorbed in the course of a few weeks. Puncture of the skin to allow escape of the air is not advisable, for such a proceeding predisposes to infection.

Summary

Non-traumatic (non-tuberculous) generalized subcutaneous emphysema is of infrequent occur-

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rence in adults and even less common in children. The cause is an increase of intra-pulmonary pressure which, as in pertussis, is due to prolonged and excessive coughing, and which induces rupture of a previously weakened alveolar or bronchial wall and allows air to escape into the mediastinum and thence to other parts of the body.

An instance of this is presented in an asthmatic child aged three years who developed general interstitial emphysema during an attack of pneumonia.

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Use of Radium in Internal Medicine.—Radium chloride was given by Edgar V. Allen, Harry H. Bowing and Leonard G. Rowntree, Rochester, Minn., thirty-seven times to twenty-two patients suffering from hypertension. The condition of five of these was diagnosed malignant hypertension, and of seventeen, benign hypertension. Of the group of benign cases, nine were classified as mild and eight as severe. The dosage of radium chloride varied from 10 to 50 micrograms, intravenously, but 10 and 25 micrograms were most frequently used. Except in one case, it did not produce untoward results. In this instance sweats and diarrhœa occurred, associated with dysuria, all of which disappeared in the course of two or three days. Sensations of bodily warmth, of flushed skin, and of somnolence for a day or two following the injection were common. The treatment did not yield sufficiently favourable results to encourage its further use. Following the injection, a transient fall of pressure was observed similar to that following the use of sodium nitrite or phenobarbital. In two cases there was a slight response, which persisted during the period of observation. Radium chloride was used intravenously to relieve pain thirty-nine times in twenty-eight cases. The response of the pain of thrombo-angiitis obliterans, and to a less extent of diabetic neuritis, was gratifying. In a miscellaneous group, consisting of endarteritis obliterans, neuritis, arthritis, and pruritus vulvæ, the relief was not sufficient to warrant further usage. The best results were obtained in the relief from pain in thrombo-angiitis obliterans, but even in this condition radium therapy has been replaced by treatment with non-specific vaccines, which yield even greater relief. Hence the authors summarize their views as follows: (1) Radium chloride sometimes lowers blood pressure, occasionally quite markedly, but the same results can easily be obtained by other and simpler methods. (2) Radium chloride relieves pain, and the relief is occasionally marked; but the same results can usually be obtained by other and less expensive measures. (3) While qualitatively radium may relieve pain and reduce blood pressure, the results quantitatively usually fall far short of success. (4) The use of radium in these conditions is justifiable provided the commoner methods have failed, but even when so used the results have usually been disappointing in the end.—*J. Am. M. Ass.*,—Jan. 15, 1927.

Toxæmias of Pregnancy and Treatment of Eclampsia.—J. Whitridge Williams, Baltimore, is an ardent advocate of the conservative treatment of eclampsia. He says that in mild as well as severe cases of eclampsia, the results are better under conservative than under radical treatment. In mild cases, a modified Stroganoff technique gives almost ideal results. In severe cases, such treatment gives twice as good results as more radical treatment, but is still followed by a mortality so high as urgently to demand improvement. It appears that all the generally used anæsthetics superimpose an additional toxæmia on that associated with the disease. Consequently, the operative treatment of severe eclampsia will probably not show better results until some non-toxic anæsthetic is discovered. It appears that, after accouchement forcé, cæsarean section performed under the usual general anæsthetics is the worst treatment for eclampsia. The necessity for still greater extension of prenatal care is the most efficient means for the prevention of eclampsia. The treatment of eclampsia must remain empiric and relatively unsatisfactory until the actual cause of the disease is discovered.—*J. Am. M. Ass.*, Feb. 12, 1927.

Editorial

THE CLINICAL STUDY OF MENTAL DISORDERS

FRANCISCUS SYLVIUS, *nee* Francois *ou* Franz de la Boe, was a sturdy boy just entering his teens three centuries ago. Although the fashion of Latinizing names, which had been long prevalent among those who were ambitious to be regarded as scholarly, had begun to die out, he showed a certain conservatism by adhering to that entirely pleasant type of affectation. A survival of the custom, in somewhat attenuated form, remains in the method of appending signatures to college diplomas; a "dear, delightful proof" that archaic practises may still be reverenced. We associate Franciscus Sylvius more particularly with the iatrochemical system which he is credited as having originated, and which, by harsh critics, has been debited with more fatalities than the thirty-years' war. In the absence of satisfying statistics we may well doubt such a statement; otherwise our faith in *vis medicatrix naturæ* will be sadly shaken. Moreover—*de mortuis nil nisi bonum*. (The more closely one approaches the sere and yellow leaf, the more ardent is his esteem for that pious sentiment). Let any evil which Sylvius may have done be interred with his bones. He played a part in the translation of alchemy into chemistry. He gained considerable reputation as a clinical teacher. He disturbed minds that needed disturbing. And it is just possible that a declaration of his is needed to-day: "Whoever is unable to treat the diseases of the mind is no physician."

Few conditions which confront the general practitioner are so discomposing as mental disorders. The diseased heart or liver or kidney can be visualized: one has seen hearts post-mortem which murmured during life, and has felt them and examined them from all angles, and has learned that certain abnormalities of heart sounds are dependent upon certain structural changes. Such knowledge suggests what may be done in treatment. But the mind cannot be seen or heard or felt, nor does the post-mortem examination of its "organ" often reveal changes which explain the mental disorder that existed during life. And so one is overwhelmed with a sense of helplessness when called upon to treat a mental patient, and can only hope that he will be able to muddle through the proper treatment of him without disaster. Too often, it is to be feared, the cracked mind is given the job of mending itself.

No department of medicine has escaped the stimulus of research, slightingly and most unjustly termed the fetish of our age. In psychiatry, as in other departments, the research may not have been always well planned or well directed, but much productive work has nevertheless been done. Doubtless, the greatest hindrance to progress lies in the unfortunate fact that institutional men, to whom this work is mainly relegated, seldom have the opportunity to deal with other than end results. It is really only in psychiatric clinics and psychopathic wards that institutional cases come under observation at any early stage. The great opportunity of studying the beginnings of mental disorder lies with the general practitioner. If his training could fit him for really intelligent and whole-hearted co-operation with the institutional men, a great obstacle to advance would be removed.

"The Clinical Study of Mental Disorders" was chosen as the subject for his presidential address at the last annual meeting of the Royal Medico-Psychological Association, by Dr. J. R. Lord. This has been published as a special number of the *Journal of Mental Science*, and may be fittingly described as an exhaustive and singularly illuminating résumé of past achievements and future possibilities in the psychiatric field. The past record is one which justifies pride, and is keenly analysed by Dr. Lord for guidance in future studies. Due credit is given to the several schools of psychology, and the various methods of approach other than the psycho-

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logical are given careful consideration. In Dr. Lord's estimation progress in psychiatry has been held up by dissociating mind from body; by dissociating the nervous system from the body; and by neglecting sociological considerations. In the normal functioning of mind, account must be taken not only of the neural machinery of mind, the complex biochemical and physiological processes which go on at all functional levels of the nervous system, but also of accessory physical states, the harmonious interactions of all the organs and tissues. The two aspects, psychical and physical, are so closely and complexly associated that skilled collaboration of many branches of mental and medical science is essential to their determination. In most cases of acute mental disorder the complicated clinical picture results from the establishment of a vicious circle—mind reacting on body and body on mind. The psychiatrist, upon whom falls the responsibility of diagnosis and treatment, should be supplied with a complete clinical picture of the case, including its pathology, psychopathology and ætiology, gained through every avenue of approach—physiological, psychological, sociological, etc. Hence, there must be team work, expert and specialized, co-ordinating the data obtainable from every avenue of approach. And this team work is of importance not only in the diagnosis but, again, in determining the discharge of the patient, when the mental "make-up" should be considered in relation to the environment to which the patient is to return. The psychiatric team should have a personnel capable (1) of the investigation of the family and personal history, the influence of environmental conditions, and the history of the patient's illness; (2) of the psychological examination; (3) of the physical examination (systemic, chemical, bacteriological, serological, hæmatological, etc.); (4) of the diagnosis and categorization; and should include consultants in the several specialties. At its disposal, there should be ample facilities for x-ray, and other laboratory work and for the application of any form of treatment which may be indicated. Such a team can be most readily established in connection with a general hospital, but by centering effort upon cases of recent development and encouraging medical officers each to specialize his work, the mental hospitals could organize on practically identical lines.

Dr. Lord's aim is the reconstruction of psychiatry as a medical science. The psychiatry which he envisages is one which has broken through its legal bonds, and no longer limits itself to the study and treatment of cases of mental disorder flung to it by the law. This latter aspect of psychiatric practice will be a secondary consideration, and will no doubt be as efficiently done as now, but psychiatry work will no longer centre in it. Dr. Lord also hopes that under the new order of things the necessity for legal interference will be a diminishing factor. It may seem in some degree paradoxical, but many of those mental disorders which have frequently given rise to psychiatry as a strict specialty, because they necessitate restriction of the individual's liberty, are closer to general medicine than the neuroses and psycho-neuroses. The practice of psychiatry should not be limited to mental specialists as is commonly thought. Such a narrow view can no longer be justified. The psychiatry Dr. Lord envisages, covers the whole field of medicine as practised by the well trained practitioner, the neurologist and the mental specialist, aided by specialists in diseases of the eye, ear, nose and throat, and by the dentist, and by any other specialist, if needed.

It is not merely in declared insanity that the mental factor is of importance. In a serious illness, particularly if surgical treatment is required, the anxiety of the patient is always considered, and the desirability of instilling hope and confidence is fully recognized. But perhaps minor illnesses are even more likely to be unfavourably influenced by an unsatisfactory mental attitude. In this case less obvious and maybe deeply hidden causes, which have long been operative are responsible for a mental attitude which militates against success in treatment. All grades of such interfering complications enter into the experience of the practised physician. The culmination is reached in the neurotic woman who persists in wearisome reiteration of her iliad of woes. Her suffering is very real, and the same is true of those in whom the mental factor is less declamatory. If the physician is to have

success in such cases, he must know how to deal with them. They are very numerous, and they have a just claim on our sympathy. If we do not understand them, we should at least make an honest endeavour to do so. And an understanding requires investigation of the mind, mayhap to its innermost recesses.

Strait is the gate and narrow is the way which leads to the mind's depths, and the few that have found it seem to have been guided by an uncanny instinct. There should be a better way, one that can be made plain to every one. That way can be found only by research. In order that the teaching of psychiatry may become more adequate, its clinical study must be more thorough. The plan outlined by Dr. Lord is full of promise, and it is to be hoped that it may meet with general acceptance.

W. H. HATTIE

ON RACIAL DECADENCE

THE future of the human race has for many years been the theme of much speculation, especially since the Great War, and possibly as a result of its influence depressing forecasts since its close have considerably outnumbered brighter outlooks.

In a recent address by the Dean of St. Paul's before the Royal College of Physicians, the Dean chose this subject to speak on as being one of supreme public interest, but stated that he had taken the negative side of eugenics with its forecast of racial degeneration rather than racial improvement, not because he had any natural tendency to dwell on the dark side of the changes which might be proceeding in the human race, but because at the present time he considered that to warn of a possible future was the safest course. As a race we should consider all possible measures by which we can counteract the dysgenic effects of a highly artificial civilization. To understand what has happened in the past and what may happen in the future it is only necessary to examine what is happening. All science is based on the belief that in natural laws there is neither variableness nor shadow of turning. Biological progress implies increase in complexity of structure and function, with increasing specialization and co-operation of parts; and what we call human progress is no more than this. Specialization in one direction always means limitation in another direction. Highly differentiated organisms are fit only for certain conditions, and when those conditions are changed the organism must either perish or return to a less differentiated type. In the human species there has been three stages of evolution, increasing complexity of bodily structure, increasing intelligence, and increasing social organization, and it was broadly true that when a new stage began, the evolution of the earlier stage became less active. If we judge from other living organisms on the earth, stability seems to be the rule, change the exception. Perhaps nature has expended nearly all her ingenuity, as there appears to be no new classes since the appearance of mammals and birds in early times. Social evolution appears to have come to an end in insect life with bees and ants. State socialism can go no further in these suffragette Utopias governed by maiden aunts; and these societies afford a definite warning to us. Perfect co-operation has sacrificed the individual completely.

Man has been a distinct species probably more than a million years, but anything like civilization is a matter of the last ten thousand years. This is a very short time for man to adapt himself to revolutionary changes in his habits, and we need not wonder at the maladaptations or disharmonies, bodily as well as mental, which exist to plague us in our health and conduct.

Physical changes appear to be now going on in our bodily structure as rapidly as ever, only unfortunately they seem to be mainly degenerative. Changes are said to be taking place in the size of our toes, in the size and strength of our teeth, and our jaws are becoming too small for the present sized ones; noses are said to be becoming sharper and

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narrower, baldness in middle life is said to be increasing, and atrophic changes are said to be taking place in that useless organ the appendix. As regards the organs of sense the Dean stated that it would appear that our eyesight is also deteriorating. Few middle aged men at the present age can read a closely printed book without glasses, although the ancient Greeks, a singularly long lived race, went on reading and writing to extreme old age without mechanical aid. Had human intelligence advanced during the past five thousand years? This would seem doubtful, if we consider the large and well ordered communities in which the ancient Egyptians lived, while in many respects the ancient Greek would appear to be our superior. It cannot be disputed that those qualities which were regarded as essential to progress had in the present age no longer the same survival value. In the older societies a highly cultivated minority flourished and produced achievements which were the wonder of posterity, and some biologists accepted this type of state as the best. Unlimited competition exhausted the competitors, but in all the higher faculties competition was not the chief motor force. The millionaire was not the supreme human product. A society with well marked castes might be successful, because by encouraging good traditions of skill, it mitigated competition. The plan of developing to the utmost a small selected class had been tried several times, but it had not been proved that equally good results might not have been obtained by other methods involving less injustice. It used to be supposed that environment had much to do with health and development, and that Europeans were unable to keep their health in a tropical climate. Professor Carl Pearson, however, has recently stated that if the relative importance of nature and nurture in determining bodily and mental character were compared, it would be found that nature was at least five times more important than nurture.

Analogy suggests that the weight of sustaining civilization is thrown upon heredity, while the other faculties, by which man slowly raised himself from savagery, are likely to become partially atrophied. Civilization is mainly the result of accumulated knowledge and experience. Each generation stands on the shoulders of the last, and has the chance of climbing higher from that point. Nevertheless, we have to bear in mind that civilization is not working towards the higher development of the national stock. Our social science has been too exclusively environmental. Nature, we were told long ago, takes away organs which are not used. The free moving creature which becomes a parasite drops all its organs except those which enable it to hang on and suck. Ever since the growth of the machine age, there has been a destruction of natural beauty, a squandering of irreplaceable natural resources, and a progressive loss of many of the exquisite works of skill wrought by the human hand. The old handicraft man was in every way a superior and more civilized animal than the mechanic, who has to deal only with machines. Machinery has transformed a skilled into an unskilled population. The modern worker is now dependent on the machine, which has ousted him from natural human occupations. The great modern danger is that human beings have become parasitic on the machines which they have made for their own use. This last is a source of definite racial decay. Man has become only a tool maker.

A recent writer states that permanent progress is a matter of breeding rather than of pedagogics, a matter of gametes not of training. As our knowledge of heredity clears there grows upon us an ever increasing and relentless force, the conviction that character is not made, but born. It is true that the transmission of character is now seen to be far more complex than was once supposed. It is usual now to speak of unit factors, not of unit characters, and character showing marked ability in any direction is probably due to the combination of several unit factors, the absence of one of which may spoil the result. We do not yet know sufficiently about the action of the gene, but we may learn much by collecting family histories, and observing what qualities tend to reappear in the second and succeeding generations. Pedigrees of able families are abundant since Galton inaugurated this method of approach, but I fear Galton hardly allowed sufficiently for the good start which the son of an able man has under the stimulating influence of the home circle in which he is

brought up and for the opportunities of a good education which his father's success has afforded to him.

Are some kinds of ability more strongly inherited than others? I believe this is so, and I believe that no kind of ability is more strongly inherited than the qualities which lead to academic distinction in literature. I believe that if a thousand professional families would draw up records of their special abilities it would be of real scientific value.

Our future is in our own hands, to make or mar. History seems to show that in the rise and fall of peoples, economic factors are of secondary importance. No advantages will save a people from decay when it loses its natural superiority. Nations do not grow old like individuals. That is a false analogy. But they do die of disease when the burden of civilization becomes too heavy.

ON RESUSCITATION AFTER SYSTEMIC DEATH

IN an address delivered before the London Association of Medical Women's Federation, Dr. Harrington Sainsbury discussed the problem of resuscitation after systemic death. Systemic death, he said, while putting an end to the corporate life of the body viewed as a collection of associated organs and tissues does not terminate somatic life, namely, the life of the body viewed as a collection of dissociated organs and tissues. At the moment of death these organs and tissues retain more or less of individual life and have their several rates of dying although in no case is the tenure of life of long duration. Since the blood is the carrier of elements indispensable to the tissues, its coagulation point is a crucial factor in the determination of the possibility of resuscitation. This question of possible resuscitation will scarcely arise in the case of death at the natural term of life where all the vital powers have been manifestly ebbing. Neither will it arise in the case of a long drawn out and exhausting disease, such as tuberculosis and cancer, although in some cases the recovery of sufficient powers of the mind and body which might permit of some important act, say for testamentary purposes, might have to be considered. On the other hand, however, an attempt should be made to secure resuscitation in cases in which the inherent powers of the tissues are unexhausted, and death would appear to be of the nature of a suddenly suspended animation which has arisen abruptly either at the heart or in the lungs. In such conditions there is no reason why, if the heart and respiratory apparatus can be restarted, life should not proceed to its usual term. Such a possibility confronts the doctor in the case of the still-born infant, and in more adult life when through the shock of mishap or acute disease, or in the midst of an operation or during the administration of the anæsthetic before the operation has begun, heart and respiration suddenly fail. Under such circumstances life may be regarded as capable of resuscitation, and with our present knowledge the physician may be considered remiss in his duties if some attempt is not made. Dr. Sainsbury said that the period during which the blood remained fluid and the heart muscle retained its contractility could not be given precisely in minutes, but must vary with the individual. Cardiologists of the newer school had thrown doubt on the susceptibility of the heart to direct stimulation, but in his opinion this attitude of scepticism ran counter to very definite evidence. Undoubtedly, adrenalin should now be placed first on the list of recognized cardiac stimulants. An alternative method of cardiac stimulation is cardiac massage—a measure which has been successful in several reported cases—but Dr. Sainsbury considered that the use of adrenalin should always, if possible, be the first employed because of the simplicity of the procedure, its rapid applicability, and because of the comparatively slight risk involved and the small amount of general disturbance. In the case of sudden unanticipated and unprepared-for death, the case for resuscitation was overwhelmingly strong; therefore, in every hospital and in every

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nursing home, and in the emergency equipment of every medical practitioner the apparatus for intracardiac injection and a fresh solution of adrenalin should always be kept in readiness.

It appears that the best place for making the puncture is in the anterior surface of the right ventricle at some distance from the base and interventricular septum, so as to avoid the anterior coronary vessels. This point corresponds to the fourth left intercostal space, at the upper margin of the fifth intercostal cartilage close to the sternal border. Just before the injection artificial respiration should for the moment be arrested in the expiratory phase to avoid wounding the lung. The course of the needle should be at first perpendicular to the thoracic wall for 2 or 3 cm. It should then be slightly inclined towards the median line when it should strike the heart wall and the operator should be conscious of its resistance. Advancing the needle another 0.5 cm. the right ventricle is reached. From 1 to 3 c.c. of a 1/1,000 solution should be made slowly into the muscle and artificial respiration promptly resumed as soon as the needle is withdrawn. This method has had its greatest success (50 per cent) in cases of syncope occurring during chloroform, ether or spinal anæsthesia; also in certain cases of narcosis and asphyxia. When organs are diseased the possibilities of success are much diminished.

ON GOITRE

IN a recent issue of the *British Medical Journal**, Robert McCarrison reports upon the continuation of his studies of goitre and its prevention. It will be remembered that McCarrison has been disposed to attribute goitre to a bacterial cause rather than to any chemical deficiency in the water. At the commencement of his investigations at Sanawar, Punjab, in 1913, 66 per cent of girls above the age of sixteen years resident scholars in the Royal Military School were the subjects of notable goitres. In 1918 a new water supply was introduced, taken from the neighbouring station of Kasauli. By 1923 the incidence of goitre had been reduced to 2.2 per cent, which is no greater than in non-endemic regions. In fact, the condition had been practically eradicated by 1921, three years after the introduction of the new water supply—a result unparalleled in the history of goitre prophylaxis. Recently, the water and soil of Sanawar and Kasauli were investigated by three chemists, who worked quite independently. All reported that the soils and waters of both localities are poor in iodine, and that there was no significant difference in the iodine content of the soil of the two places; but the water formerly supplied to Sanawar contains appreciably more iodine than that now being supplied, which contains little or none. The disappearance of goitre cannot, therefore, be attributed to the presence of iodine in the new supply. No important changes had been made in the diet. McCarrison concludes that his contention that goitre is due to bacterial impurity of the water supply is substantiated.

W. H. HATTIE

In a letter on this subject, Dr. Eberts also calls attention to the use of boiled water as an important factor in reducing the incidence of the disease, and considers that the change in the water supply in Sanawar, India, which proved so effective, was due to its purity and the result was the same as if it had been sterilized by boiling.

The favourable results obtained by using sterile water is explainable on the supposition of the presence in the intestine of some as yet unrecognized bacteria, which are capable of altering or appropriating the iodine, and thus interfering with the assimilation of any available iodine in fresh food, thus creating a shortage of iodine in the blood. Dr. Eberts does not consider as proven the statement of Rosenau that disease of the thyroid is due to a spirochætal or bacterial invasion. Apart from thyroiditis of the toxic type or of the suppurative type, both of which are comparatively rare, abnormal

* *British Medical Journal*, January 15, 1927.

thyroid function is clinically unassociated with any signs of inflammation. He, therefore, declines to accept Rosenau's statements until his investigations have been fully confirmed by other observers. The view which at present receives most support is that in goitre we have to deal either with the presence of special bacteria in the intestine or in the water met with in certain districts which in some way interfere with the assimilation by the system of the iodine in the food supply, and the administration of iodine either acts by checking the activity of these microorganisms, or by definitely adding to the depleted supply in the system.

THE MEDICAL PROFESSION FROM AN INTERNATIONAL VIEWPOINT*

Dr. George E. Vincent in a recent paper appearing in the *American Journal of Psychiatry*, describes three fundamental types of medical education, each with certain disadvantages of its own, but tending toward modification of its peculiarities through an international process of "cross-fertilization."

The first is the British system. The student is an apprentice, the hospital ward is his workshop, and his instructor is a master in the craft. The aim of this system is to turn out a well-rounded general practitioner. Dr. Vincent asserts that while advances in medical science have disturbed this system to a certain extent, nevertheless even at the present day the sciences are regarded as only ancillary to "walking the wards."

The second type of medical education is the Latin, with headquarters in Paris. There are lectures, but attendance upon them is not compulsory. The students crowd the hospital wards and receive clinical instruction. Laboratory developments in France since the time of Pasteur have influenced medical education as a whole, but have had little impression upon the medical schools. The outstanding features of the Latin type are the clinic and the special attention paid to the more brilliant students.

The third type of medical education is the Teutonic or German type. The medical institute of a German University is headed by a great scientist, who devotes much of his time to teaching. A clinic attached to the University is a great source of inspiration and stimulus to medical science. But the institute and the clinic are individualistic and rarely work together. The undergraduate student has little chance of contact with the patients; but ward privileges are reserved for the best graduates who get a very high type of training.

Medical education in the United States, says Dr. Vincent, is a combination of the systems of other countries. "Originally we were fundamentally British," but German and French ideas and methods have modified the American system. Dr. Vincent emphasizes the value of the team-play between laboratory, medical school, and hospital as the outstanding feature of American medical education. He admits some defects, however. An Englishman, after visiting American schools said: "When do your students get time to think?" A committee has been recently appointed to investigate the medical curriculum for undergraduates.

The aim of medical education must be the development of good all-round diagnosticians and fairly good practitioners. Much of the special work in the undergraduate course should be removed from the undergraduate curriculum and put into graduate work. The students should have the opportunity of "developing their own aptitudes, their intelligence, their imagination and such special capacities for work or investigation as they may possess. The psychiatrists will have a part in these developments."

According to Dr. Vincent the psychiatrist has a viewpoint midway between the psychological, and the physiologico-anatomico-chemical. "He is standing for the interpretation of the patient in terms of all the knowledge that can be secured." This high tribute to the psychiatrist's point of view and conception of the patient is noteworthy.

The report of the Committee on Investigation into Medical Undergraduate curriculum will no doubt prove interesting reading.

A. G. Morphy

Am. J. Psych., October, 1926.

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PARA-THOR-MONE

THE success of Collip in devising a method for preparing a stable preparation of the active principle of the para-thyroid gland has at last provided a sound basis for the investigation of the clinical value of this hormone. Until quite recently opinions regarding the experimental and clinical actions of parathyroid extracts were remarkable chiefly for their discordance. The work of Collip provided an explanation, for he showed that the parathyroid contained an active principle of great potency, but that most, if not all, of the principle was lost by the usual methods of preparation. He developed a technique by means of which this elusive active principle could be obtained as a stable preparation, and it is now being prepared on a commercial scale under the authority of the University of Alberta. Collip has also devised a method for the biological standardization of the active principle, and the clinical unit is one hundredth of the quantity required to cause an increase of 5 mg. per 100 c.cm. in the calcium of the blood serum of a dog weighing 20 kilograms. The preparation, as issued, contains 20 c.cm. It can be given subcutaneously, intramuscularly or intravenously. The human dose ranges from 10 to 30 units a day, and has been found to be a true specific for the *tetania parathyreopriva*. It has also been found of value in idiopathic tetany, infantile tetany and sprue. Those who desire to employ this preparation must remember, however, that like all drugs which produce a definite physiological effect, para-thor-mone must be used with care and discretion. Collip found that in dogs injections even of small amounts repeated at intervals of a few hours proved fatal if the injections were continued after the development of vomiting, an early symptom of an overdose. It is satisfactory to learn the drug is now available for general therapeutic use.

INFANT MORTALITY

A STATISTICAL study of the social problems bearing on the infant mortality rate in the birth registration area of the United States of America presents facts of interest to the profession in Canada. In this small volume on *Infant Mortality and its causes*,* the methods of investigation of these problems are outlined, and several interesting conclusions are reached. The decrease that has taken place is remarkable, and the chief agents that have brought about this decrease in the brief period of six years are to be found in the various movements for the protection of the infant health and, doubtless also in those for general public health protection and sanitation. The growth within the past few years of public interest in infant-welfare work, in child-health work, and (recently) in prenatal work for expectant mothers has been noteworthy. Much has been effected by the distribution of health-instruction pamphlets to mothers, and by the establishment of child-hygiene centres. Other factors in this decrease, the importance of which should not be slighted, are the progress of medical science, the improvement of the technical training of physicians, and the increased number of pædiatrists, the improved standard of milk distributed, and the steady extension of sanitation to larger numbers of the population: all these factors doubtless have played their parts in the reduction of the infant mortality rate by one-fifth in the short space of six years.

The conclusions set forth are drawn from the records of nearly 23,000 live-born infants. For the entire group the infant mortality was found to be 111 per thousand. A number of factors appear to bear on this mortality rate: the age of the infant, (the mortality dropping from forty-four in the first month to four in the twelfth); a marked

* Infant Mortality and its Causes, Robert Morse Woodbury, Ph.D., 192 pages, price $3.50, Williams & Wilkins Co., Baltimore, 1926.

seasonal variation, and sex; boy babies showing a 25 per cent higher mortality than girls. Among the important underlying causes of a higher death rate were the following; lack of health and physical vitality in the mother during pregnancy and confinement; prenatal eclampsia and maternal tuberculosis and the death of the mother during the child's first year. The mortality rate in infants whose mothers were reported to have had medical prenatal care was decidedly lower than that of those whose mothers had no prenatal care. The age of the mother, the order of birth, and the interval between births also bear a relation to infant mortality. The mortality rate among prematures was six times the normal, twins and triplets three and a half times, and instrumental deliveries about 20 per cent above the normal. The mortality rate in the artificially fed was between three and four times as high as was that in the breast fed. Housing congestion, maternal employment during and after pregnancy and low family earnings all bear a causal relationship to infant mortality.

Comparing by statistical methods the actual with the expected deaths in artificially fed babies it was found that the actual deaths were almost four times the expected deaths. The evidence indicated that when the change from breast to artificial feeding occurred, in the second, third, fourth, fifth or sixth month, the average death rates for infants whose breast feeding ceased entirely, or was first supplemented during those months, were higher than those for infants who continued to be breast fed by a healthy mother. When the change was made in the seventh month, or afterwards, however, the average death rates for infants whose feeding was changed were slightly lower than those for infants whose feeding remained unchanged. Complete weaning before the eighth month was associated with a relatively high mortality. The conclusion is that the ill effects of early artificial feeding manifest themselves in increased mortality during the later months. An analysis of the death rates indicate that the high mortality among infants who were artificially fed arose chiefly from gastric and intestinal disease; disease especially connected with improper feeding.

Nationality must still be regarded as a factor in infant mortality rates, although the exact nature of its influence is difficult to define. A striking correlation is found between low income and housing congestion, and the amount of care available for the mother during pregnancy and confinement, and for the infant during the first year. Attention is drawn to the fact that New Zealand has the lowest infant mortality rate (forty per thousand) of any country in the world. This is in part due to climatic conditions, but is in greater part the result of the excellent state maternity hospitals, the laws regulating mid-wives and nurses, the protection of children boarded out apart from their mothers; the painstaking infant welfare work carried on by the Royal New Zealand Society for the Health of Women and Children, founded in 1907 by Dr. Truby King, has undoubtedly had a most important influence in the reduction of the infant mortality rate, which has fallen from eighty-two to forty-four in the last twenty-five years.

R. R. STRUTHERS

A recent writer has expressed the opinion that the present successful efforts to lower infant mortality will probably result in a higher child mortality, and the lowered death rates of infants and children may bring to the reproductive age many weaklings who otherwise would have left no offspring. In other words the increased medical skill, and the spread of birth preventive methods will result in a race naturally weaker than the one before it. This thought is combated in a recent editorial of the *Journal of the Americal Medical Association*, in which it is stated that there is no reason to believe that babies with an outfit of potential qualities of great benefit to the race are any less resistant to disease than babies destined to be hewers of wood and drawers of water. The Spartan methods of bringing up children may definitely weaken those that survive. Infant welfare work not only achieves a direct saving of life, but operates to preserve subsequent bodily fitness and resistance by reducing the incidence of diseases that injure even when they do not kill.

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CYCLIC VOMITING AND MIGRAINE

THE etiology of cyclic vomiting and of migrainous attacks have been a matter of discussion for many years, and the nature of both is still far from being settled. Both have received special attention in recent discussions, but no definite or important conclusions regarding them were reached.

The so-called *cyclic vomiting* of children has, for many years, been regarded as associated with, if not actually due to, ketosis. Marfan some years ago in his volume on *Diseases of Children*, gave it the name of acetonæmic vomiting, and considered its cause as arising from an inherent intolerance to fats, and for many years treatment consisted in prescribing a diet in which fat was restricted. This treatment was seldom successful and, recently, Professor Morse of Harvard referred to the theory of ketosis as a popular fallacy, and, although attributing the attacks of vomiting as frequently due to dietetic faults, did not think that ketosis and fats in excess were a frequent cause of the condition. Since then, other suggestions have been made regarding its causation, and, by not a few writers, a chronic appendicitis has been accused as frequently being an important factor, and success has been claimed for appendectomy. Professor LeWald of New York, in a recent number of the *Journal of Radiology*, gives the result of an analysis of forty-four children examined by the Roentgen rays. Some abnormality in some part of the intestinal tract was found in the majority of cases, but no one condition was so constantly present as to suggest that it was the important etiological agent. Abnormal length of the colon was his most frequent finding, being present in thirty-five cases, while a dilated and ptosed stomach was found in twenty-three, but the two conditions were often present together. Professor LeWald inferred, as the result of his analysis, that cyclic vomiting is probably of a reflex nature, and is usually associated with an abnormality or defect in some portion of the digestive tract. Whether these abnormalities were congenital or acquired was not discussed. His final conclusion was that cyclic vomiting is not an entity, and has no specific cause, and that this perhaps, is all which can at present be said regarding the etiology of this disease, but it is a statement which should discourage the adoption of any stereotyped line of treatment.

The etiology of migraine is an allied condition which gave rise to considerable discussion at the last annual meeting of the British Medical Association. Dr. E. I. Spriggs proposed the following as the best working definition available at the present: "A periodic headache commencing usually with some kind of aura, and going on to vomiting; the attacks beginning in childhood or youth, and often appearing hereditary." Regarding its etiology, it was agreed that there must be some predisposition in the constitution of the sufferer which enabled a rather long and diverse list of determining causes to act. Regarding the actual mechanism of the attack there was no unanimity of opinion. Dr. Bramwell considered it a vascular derangement, due to a localized spasm of the cerebral arteries, during which the aura and other prodromal symptoms occur; this spasm was followed by a relaxation inducing an engorgement of the meningeal vessels, giving rise to the headache which then became the chief symptom. Dr. Timme of New York, propounded a theory that the symptoms were due to an increase in the size of the pituitary body, raising the intracranial pressure locally and generally. Of a hundred cases in which headache was the main symptom for which the patient applied for treatment, in twelve only was the diagnosis of migraine made, whereas in thirty-seven the attacks were referred to some gastric condition. The final conclusion arrived at from the discussion appeared to be that before a diagnosis of idiopathic migraine is made, a careful search should be made for some lesion or disorder, frequently gastro-intestinal in character, the cure of which will check or possibly arrest the attack.

OUR IMMIGRATION LAWS

THE effects of the United States immigration laws have been engaging the attention of American sociologists, and in a recent brochure Dr. Clifford Kirkpatrick has published a detailed examination of the effects of immigration upon the intelligence of the general population as tested by modern psychological methods. After careful study he concludes, that while in the past, there had been great opportunity for developing a population of the highest quality by the careful selection of immigrants, that opportunity had not been appreciated, and he feared that it now was lost. While acknowledging that intelligence is not the only trait of importance socially, nevertheless his findings would indicate that groups apparently of lower intelligence are the groups that in the last two decades have entered the country in the greatest numbers. Since much of the evidence adduced by Dr. Kirkpatrick is derived from the achievement of school children rather than from the immigrants themselves, the findings are such as to raise grave doubts for the future. Especially is this true when birthrates are sidered, which for several past decades would appear to be much higher among those immigrants whom we must regard as of lower intelligence. Kirkpatrick would have an individual selection of immigrants based on careful measurement and mental power made as completely as possible, and before the time of arrival on the American shore.

These conclusions are of the greatest importance to us as Canadians. The desirability of an increased population for this country is unquestionable. In an address recently delivered before a Canadian Club, one of the leaders in our Canadian Parliament emphasized the necessity of relaxing our restrictions. Many groups of immigrants from the very unstable states of Southern Europe have, during the past, been allowed to settle in Canada, with the result that they have made poor settlers and been a source of disquietude to their neighbours. We would commend the remarks of Dr. Kirkpatrick to all those who consider numbers to be of greater value than quality.

Editorial Comments

HIGH BLOOD PRESSURE

Among physiologists who have brought physiology into more intimate touch with medicine is Professor J. A. MacWilliam of Aberdeen, who has long been actively engaged on the problems of blood pressure. A series of papers on this subject appeared in recent numbers of the *Physiological Review* and in the *British Medical Journal** an address delivered by him before the James MacKenzie Institute for Clinical Research appears under the title of "High Blood Pressure from a Physiological Aspect."

In this address Professor MacWilliam brings forward many suggestive points. He emphasizes the importance of combining both the auscultatory and tactile methods in estimating the blood pressure, and tells us that a fallacy may arise from repeated or continued compression of the arm of a patient, which may influence the auscultatory records of the systolic pressure, and make them appear lower than records obtained by the finger.

A review of the numerous statistics now available of blood pressure at different ages shows that clinical observers have over estimated the normal rise of blood pressure in the second half of life; in his opinion it should not amount to more than 15 mm. Hg. The incidence of cerebral hæmorrhage in persons with high blood pressure is estimated to be about 20 per cent of the total number, and frequently occurs during sleep, a period when the systolic pressure is supposed to be at its lowest. He made, however, the interesting observation that, whereas in sound sleep the blood pressure falls, in disturbed sleep the systolic pressure may rise 50 to 70 mm. above its ordinary height and the diastolic may rise about 30 mm. As the influence of emotion even during the day time is recognized by all, the effect of excitement during sleep is not surprising.

Some recent observations of Dr. C. Reid are quoted opposing the hypothesis that a heightened

* *British Medical Journal*, January 22, 1927, p. 151.

blood pressure necessarily improves the efficiency of the kidney as regards the excretion of nitrogenous waste products. Prof. McWilliam maintains that while it is possible that there are two categories of supernormal blood pressure—one with and one without a raised capillary pressure, there is no certainty that the pressure in one set of capillaries is an index of the general capillary blood pressure.

The possible causes of high blood pressure are discussed at some length, and although the matter is left open for final decision, the pressor influence of supernormal blood pressure would appear to be exerted primarily on the central nervous system rather than directly on the peripheral vessels as a whole.

He referred to the observation of Drs. Orr and Innes that large quantities of water by the mouth reduce high blood pressure, and, further, keep it down for comparatively long periods. This method of treatment, which has been practised empirically at spas, is thought to act by washing out metabolites presumably of protein origin. A fall of blood pressure was observed both in normal and hyperpiesic persons; the results of the further investigations which Professor MacWilliams promises will be of interest, for it is obviously of much practical importance to know in what kind of case the method is likely to be successful. On *a priori* grounds patients with impaired renal excretion would appear to be unsuitable, and Drs. Orr and Innes find that when the diuresis cannot keep pace with the intake of water, as may occur in renal inefficiency, there is a rise of blood pressure above the original level before the fall appears. But if this were the only contra-indication, the washing-out treatment should be much more effective than it has been in the past in persons with pure hyperpiesia—that is to say, without any renal change or disorder.

MALARIAL TREATMENT OF GENERAL PARALYSIS

A paper entitled, "Types of therapeutic response observed in the malaria treatment of general paralysis," by George H. Kirby and Henry A. Bunker, together with a report of the discussion which followed its reading, appears in the *American Journal of Psychiatry* for October, 1926. Kirby and Bunker considered the record of 106 male patients who had completed treatment from four to thirty-three months before the paper was prepared. Full remissions resulted in 34.9 per cent of the cases; moderate remission in 12.3 per cent; slight improvement in 7.5 per cent. In 24.5 per cent there was no improvement. Death occurred during the course of malaria in 6.5 per cent, within six weeks after the final paroxysm in 5.6 per cent, and in from two to eleven months after the malaria in 8.5 per cent. A series of tables, with comment, on types of response to the treatment while full of interest, cannot be readily summarized. Of forty-one patients followed for more than a year, with no further anti-syphilitic treatment, the spinal fluid Wassermann became completely negative in eight, was notably modified in five, was definitely modified in eleven, and was uninfluenced in seventeen. The "manic" type of general paralysis exhibited the greatest tendency to a favourable response in the treatment. No statement can yet be made as to the permanency of remissions, but thirty-six out of thirty-seven patients in which remissions resulted have been under observation for from seven to thirty-five months without showing signs of regression. Thus far, we have nothing upon which an estimate of the reaction of the individual case to the treatment can be based.

In the discussion, comparable results were reported by two other investigators. One physician pointed out that the control of the malaria is less easy than is usually supposed, and that measures to prevent its spread should be adopted. Another noted that negro paretics are less susceptible than whites to malarial infection, and was inclined to associate this with the relatively much greater malignancy of paresis in the negro.

W. H. Hattie

A SURVEY OF TUBERCULOSIS AMONG INDIANS IN THE QU'APPELLE VALLEY

In a letter from Dr. R. G. Ferguson, Director of Medical Services, and Medical Superintendent of Fort Qu'Appelle Sanatorium, we learn that the Saskatchewan Anti-Tuberculosis League under the direction of the National Research Council is at present making a study of the amount of tuberculosis existing among Indians in the Qu'Appelle Valley. An attempt is also being made in association with this survey to arrive at some idea of the influence of tuberculosis upon the general health of the tribe and their living conditions since tuberculosis first became prevalent among them. In order to gain all the information possible, a study is contemplated of all the treaty books of the Indian Department, and all reports from traders, missionaries and physicians who are familiar with the past story of these Indians. A request is made for the assistance of medical librarians who may have on their shelves journals or records covering the period from 1850 to 1880. Such a study if carefully carried out cannot fail to bring out many valuable facts. We wish the League every success.

DIPHTHERIA TOXOID

In a paper by P. J. Moloney, of the Connaught Laboratories, University of Toronto, which appears in the *American Journal of Public Health*

for December, 1926, a description is given of the methods employed in the preparation and testing of diphtheria toxoid. Some years ago, Ramon announced that diphtheria toxin may be rendered atoxic by the action of formalin and heat, without materially affecting its antigenic properties. To this product Ramon gave the name anatoxine, but in England and America the term toxoid is preferred. The advantages claimed for toxoid, in comparison with toxin-antitoxin, are freedom from toxicity and inability to induce serum sensitiveness. The relative merits of the two products cannot be said to have been finally determined. Toxoid immunizes some individuals more readily than others. In children under the age of eight reactions occur rarely; in older persons, and especially in adults, marked local and even general reactions may occur (induration and an area of redness about the site of injection, with malaise, headache and fever). These symptoms disappear in a few days. Susceptibility to reaction may be determined by first testing an individual with diluted toxoid. Seemingly, immunity develops most rapidly in those who manifest a reaction. The best dosage has not been definitely ascertained, but, for the present, 0.5 c.c., repeated in one month is recommended. W. H. Hattie

VOCATIONAL GUIDANCE

An attempt has been made in recent years by the National Institute of Industrial Psychology* in collaboration with the London County Council and the Ministry of Labour to give advice on choice of vocation to children leaving the elementary schools at the age of fourteen years, an advice based on mental and physical tests. During the past two years such advice has been given to 600 children as they were leaving their several schools. The tests applied to the children are twofold. There is a general review made based upon the findings of the school teachers which appraises the general intelligence, average attainment in school, practical ability and deftness of each child. An examination is also held by selected psychologists which estimates ability for clerical work, dressmaking, mechanism, engineering, memory for form and design, and power of attention and concentration. The results obtained by the two examinations are discussed at a conference between the two sets of examiners, and their separate recommendations show a high proportion of general agreement. For the value of these examinations, evidence must be sought in the after history of the child. The follow-up is as yet in its early stages, but so far as figures go the results are encouraging. Information regarding 160 children has been obtained. Of these, more than 100 are in work of the kind recommended by the conference. Fifty-eight are in work not recommended. In the former group there are no children who have expressed dissatisfaction with their work and only four have made changes in their positions. In the latter group eighteen have expressed dissatisfaction, and ten have had from three to eight different posts in less than a year.

* National Institute of Industrial Psychology. Vocational Guidance Experiment. Second report, 1926, 329 High Holborn, London, W.C.1.

By request we are publishing a letter from Joseph Colt Bloodgood of Johns Hopkins Hospital on the importance of tissue diagnosis in the operating room (p. 362). The reputation of the author in the field of clinical research, and more especially his long continued and self-sacrificing campaign in promulgating a widespread knowledge of the known facts concerning cancer, entitles his communication to serious consideration. The difficulties and limitations of frozen section diagnosis are well recognized. The dangers of incorrect technique in conducting biopsies should be appreciated with the publication of this letter. Surgeons and pathologists are invited to discuss these matters by correspondence, or by actual attendance on the proposed meeting in the Johns Hopkins Hospital Pathological Laboratory under the chairmanship of Dr. Bloodgood and thus advance and disseminate the knowledge of these increasingly important procedures.

Deafness in School-children.—Prof. Gustav Brühl, aurist to the Berlin School Board, recently stated that 72,000 children in Berlin schools suffer from affections of the ear, and that 7250 of them are hard of hearing, 10 per cent of these being almost deaf. The city has only six special schools where 410 deaf children are educated—an accommodation obviously far too small. It seems practically impossible to have all the hundreds of thousands of Berlin school-children examined by aurists, for not even the regulation that every child who is hard of hearing shall be shown to the municipal aurist has so far been complied with, many of the municipal schools not having sent a single child for examination. It is true that children often conceal their disability by following with their eyes the lip-movements of their teachers. Prof. Brühl is of opinion that every child who makes no progress in his work should be examined by an aurist, since deafness is so often the cause of inefficiency. Half the deaf children suffer from double chronic otorrhœa. Twenty per cent of them might be cured by adequate treatment.—The *Lancet*, January 15, 1927.

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Men and Books

AN ADDRESS ON FRANCIS JOSEPH GALL, AND THE STATE OF MEDICINE AT THE END OF THE 18TH CENTURY*

By PROFESSOR G. S. BRETT

University of Toronto

Francis Joseph Gall was born in 1758, in the Duchy of Baden, Germany. He studied medicine in Strasbourg and then in Vienna from 1781–85. He carried on research into the functions of the brain for many years, making dissections, comparing the brains of the mentally normal with the abnormal, and the brains of different animals. From 1796 to 1801 he lectured on the anatomy of the brain. Gall was asked to accept the position of body-physician to the Emperor, but declined it: he preferred to be free to pursue research. His fame grew rapidly, but already there was envious opposition. The Austrian clergy were induced to condemn Gall's doctrine as materialistic, and an edict was obtained from the Government in 1801 prohibiting all lectures not officially sanctioned. Gall wrote a remonstrance, but knowing the case was hopeless left Vienna in 1805. He went to Berlin and the usual division of opinion about his work was evident at once. Hollander quotes *The Medical and Surgical Journal*, xv, Edinburgh, March, 1806, as follows:

. . . "The craniology of Dr. Gall was the favourite topic of the German *literati* during the summer of 1805 at almost every university and capital of the northern provinces of Germany. . . In the beginning of last spring the doctor set out for Berlin, and lodged in the house of an intimate friend, Mr. Kotzebue. In Berlin he met with universal acceptance. The King, the Queen, princes and princesses, interested themselves so much in his discoveries that he obtained an invitation to go through a course of lectures in presence of the Royal Family, during which the Queen inspected the dissection of a human brain, while the doctor demonstrated the whole series of his astonishing discoveries. . . A rancorous attack was now commenced against his theory by Dr. Walter, leading anatomist in Berlin, but it failed of the intended effect, as every person was convinced that it was dictated by envy. On the opposite side, the justly renowned Dr. Hufeland, first physician to the King, almost all the faculty, as well as others professed their full assent, and several interesting tracts were published, in which ample justice was done to the theory.

. . . "Dr. Gall visited the houses of correction and prisons in Berlin and Spandau, and gave the most convincing proofs of his ability to discover at first sight, such malefactors, thieves, and men of particular talents as were amongst the convicts and prisoners. At Torgau, where he also visited a house of correction, Professor Bottiger accompanied him, who afterwards published Gall's observations, an abstract of which is given in this article."

A brisk controversy sprang up between Walter and Hufeland. Walter thought it absurd that any one should decide by mere inspection of prisoners (and Gall apparently did 200 in one day)—the nature of the crime and the curability of the criminal. In this we can sympathize with Herr Walter. Hufeland, who defended Gall enthusiastically, rejected only the doctrine of the distinction between afferent and efferent nerves: an unfortunate choice which reduces the value of his judgments considerably. At this stage Gall seems to have been much too confident about the relation between physical conformation and moral qualities.

Gall moved on to Leipzig, Dresden and Halle. At Halle, Reil attended his lectures and is reported to have said: "I have seen more in the anatomical demonstrations of the brain by Gall than I conceived a man could discover in the course of a long life." Goethe also praised Gall for his skill in dissection, taking no notice of any moral deductions. At Paris in 1807 the scientific men Cuvier, Flourens, and Geoffroy St. Hilaire were favourable. The Institute of France appointed a committee of five to judge the Memoir, entitled *Introduction au cours de physiologie du Cerveau* sent them by Gall. Napoleon interfered and reprimanded the Institute for learning chemistry from an Englishman (Sir Humphrey Davy) and anatomy from a German. The question was therefore settled in the spirit of practical politics. Napoleon, however, had his reasons and it is of some interest to hear the views he expressed, as recorded in Antommarchi's* Mémoirs (ii, 29):

"Corvisart was a great partisan of Gall; he praised him, protected him, and left no stone unturned to push him on to me, but there was no sympathy between us. Lavater, Cagliostro, Mesmer have never been to my mind; I felt, I cannot tell how much aversion for them, and I took care not to admit any one who kept them among us. All these gentlemen are adroit, speak well, excite that fondness for the marvellous which the vulgar experience, and give an appearance of truth to theories the most false and unfounded. *Nature does not reveal herself by external forms. She hides and does not expose her secrets.* To pretend

* Delivered before the Stated Meeting of the Academy of Medicine, Toronto, January 4, 1927.

* Physician to Napoleon.

to seize and to penetrate human character by so slight an index is the part of a dupe or an impostor; and what else is that crowd with marvellous inspirations which pullulates in the bosom of all great capitals? The only way of knowing our fellow-creatures is to see them, to associate with them frequently, and to submit them to proof. We must study them long, if we wish not to be mistaken: we must judge them by their actions; and even this rule is not infallible, and must be restricted to the moment when they act; for we almost never obey our own character; we yield to transports, we are carried away by passion; such are our vices and virtues, our perversity and our heroism. This is my opinion, and this has long been my guide. It is not that I pretend to exclude the influence of natural dispositions and education: I think, on the contrary, that it is immense; but, beyond that, all is nonsense." (Hollander, p. 330).

While this may be good common sense it shows that Gall's real scientific work, actual anatomy, was not so much as considered by his opponents.

In 1809 Gall began the publication of the work entitled, "The anatomy and physiology of the nervous system in general, and of the brain in particular." The work in four volumes with 100 plates was finished in 1819 and cost one thousand francs per copy. At such a price the work was not available for ordinary people and was actually very little known. Gall continued in Paris, where he had a large practice: he refused an invitation from Metternich to return to Vienna. In 1817 he was formally excommunicated. In 1823 he came to London but seems to have been disappointed by his reception. In 1828 he died five months after an attack of apoplexy. He was married twice, neither happily nor successfully, perhaps on account of his exceptional cerebral development. On his death bed he received a skull from Cuvier, who remained friendly to him though officially he could not commit himself. Gall returned it saying: "My collection wants only one more proof, and that is my own cranium, which will soon be placed there." It was placed in the midst of his collection in the Natural History Museum of Paris and is still there.

The most active champion of Gall's merits has been Bernard Hollander, who says that he began this work in 1886. In a work published in 1921 (though undated) with the title "In Search of the Soul," Hollander surveys the whole history of philosophical, psychological and anatomical doctrines concerning the soul. In this book 165 pages out of the 516 in Volume I are given to Gall, and this account contains an elaborate list of favourable witnesses. We would only mention Alexander MacAlister in the *Encyclopædia Britannica* 1910: Krafft-Ebing: and Max Neuburger (*Entwickelung der exper. Gehirn und Rückenmarks Physiologie*, Stuttgart 1897).

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To understand Gall's position in the development of science it is necessary to estimate his relation to Spurzheim and Combe.

Spurzheim was a student of divinity and philosophy who began to study under Gall in 1800. He accompanied Gall on his tour in 1804, assisted him in his dissections and acted as his secretary. In 1814 Spurzheim deserted Gall, went to England, and claimed to have a share in Gall's discoveries. Gall repudiated him, but Spurzheim continued to pose as his equal. It is admitted that the popularity of Gall's work was largely due to Spurzheim: but the emphasis was shifted from anatomy to the mixed doctrine, partly physiological and partly moral, called Phrenology. The word phrenology is said to have been "suggested in 1815 by Dr. Thomas Forster, a naturalist, in a book called *A Sketch of the New Anatomy of the Brain, with its Relation to Insanity, 1813*. In 1815 Spurzheim produced a book called *The Physiognomical System of Drs. Gall and Spurzheim, founded on Anatomical and Physiological Examination of the Nervous System in general and of the Brain in particular, and indicating the Dispositions and Manifestations of the Mind*. The work was ridiculed. The *Edinburgh Review* condemned it, and Spurzheim determined to attack this stronghold. But Edinburgh was not to be conquered: the only success was the acquisition of an ally in George Combe.

In anatomy or physiology Combe had apparently no training at all. Yet he made the reputation of phrenology in England. In 1820 the Phrenological Society was founded in Edinburgh itself: Combe was president: in 1823 the Phrenological *Transactions* began to be published. Spurzheim, prohibited from lecturing in Paris, went to Cambridge, Dublin and finally Harvard: he died in Boston in 1832. Combe continued to found societies while Gall drops out of the picture altogether. Combe's chief work—*The Constitution of Man*—was published in 1828. It was enormously successful: according to Morley's *Life of Cobden*, "it was circulated by scores of thousands of copies and . . . was seen on shelves where there was nothing else save the Bible and *Pilgrim's Progress*." But in this form Phrenology was not a science at all. It was a collection of commonsense remarks on moral principles, translated into a mixed jargon of psychological and philosophical terms. It emphasized natural causes, as, *e.g.*, that wars are due to acquisitiveness: it suggested that all the evils of life might be cured by mental and physical hygiene—which is probably true: but while the doctrine lived for a time on account of the inspiration it gave to schoolmasters and preachers, it had no depth and so withered. Almost all that can be said in favour of George Combe, whose brother Andrew was a physician of some eminence and may have influenced him, is that he turned the popular mind away from supernatural doctrines of the soul toward a simple organic explanation of human characteristics.

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The tragedy lay in the fact that popularity was gained only when scientific accuracy was abandoned.

We return now to Gall himself and consider the claims made by his supporters. They are summarized by Hollander as follows:—

(1) He demonstrated the evolution of the brain and showed its development from the ganglia in insects to the brain of the higher animals.

(2) He was the first to describe the formation of the brain in the fœtus and emphasize the importance of the convolutions as being simple in infants or idiots, complex in normal adults.

(3) He first used the method of unfolding the convolutions of the brain: and dissected the brain from the stem upward tracing the fibres from the spinal cord to the cortex. Previously the brain was cut in sections from above or scraped away.

(4) Gall first showed that the white matter of the brain is fibrous: that the grey matter gives rise to the nerve-fibres and supplies their energy: also he first demonstrated the course of the motor nerves through the pyramids, peduncles and corpora striata to the periphery of the hemispheres.

(5) Also he made the first anatomical demonstration of the decussation of nerve fibres in the pyramids.

(6) Also he first showed the true origin of the olfactory, oculomotorius and trigeminal nerves.

(7) Gall thought the cortex contained not only the centres of the higher mental acts but also the centres for motion and sensation.

It is not necessary to dwell on the more obvious facts that the brain is the necessary condition of human mentality, that there is a correlation between brain development and intellect; and that "moral insanity" may be due to physical disorders of either cerebral or visceral origin. But it may be remarked, in passing, that all this was denied in Gall's time for various reasons, such as theological bias or plain ignorance. The theological prejudices may be passed over in silence, but the nature of contemporary ignorance deserves some explanation.

Since the day of Vesalius (1543) anatomy had been slowly attaining a commendable degree of perfection, and physiology had also achieved great advances. Along with the rest of the body, the brain had received proper attention, but in spite of some good work two major errors persisted. One of these was the belief that the brain could be divided into three main areas in each of which was a ventricle, the fluids in the ventricles serving respectively for the functions of sensation in front, cogitation in the middle and memory at the back. Though this doctrine hardly survived the Middle Ages, it left as its legacy a belief in localization of mental functions and a still stranger belief that the brain was primarily an organ of secretion. The doctrine of animal spirits was held almost to the end of the eighteenth century and it logically implied chambers for the preparation and storage of these "animal," *i.e.*, psychic spirits or airs. The brain as a whole was supposed to be a uniform mass from which the directive or regulative spirits were distributed throughout the body. The intellectual functions were assigned to the soul which was said to have a "seat" in some part of the brain: the part could be selected with considerable freedom, since the mode of connection was in any case beyond human conception. Even in 1796 Soemmering taught that the water in the ventricles was the real organ of mind, adding with irrefutable logic that this would account for the remarkable intelligence of persons who were hydrocephalic! During the French Revolution many reports were in circulation that the eyes of guillotined men opened and gazed at the executioner: and these reports caused such a stir that a Committee was appointed to enquire into the facts. The work of this Committee had important results because it established the idea of reflex actions occurring post mortem, and thus dealt a blow at the common idea that all movements are under the government of the soul. This was also the age of Pinel, Esquirol, and Cabanis, three men who led the way toward more rational views of insanity, hallucination and the relation between body and mind. Reflex action was now studied more intensively: the relation between motor and sensory nerves was under discussion: the vital spirits were rejected for a *vis nervosa* which, though very ambiguously defined, was relatively harmless. The stage was thus prepared for the advent of a true observer who would revise the anatomy of the brain and set it in its proper relation to the whole nervous system. The age produced its man in the person of Gall. The period of transition from Haller, the last champion of animal spirits to Johannes Mueller, the first modern physiologist and psychophysiologist, is bridged by the work of Gall. Though he still halts between old traditions and new observations, he definitely opens a new era by his view of the brain as the complex product of integration, an organ composed of organs. This topic, however, involves the psychological aspects of Gall's teaching to which some reference must be made.

Gall's anatomical approach to the sphere of mental acts leads him to regard man and animals as differing only in degrees of development or types of development. He denies that mind can be regarded as a single unit: the word "mind' is only a convenient way of referring to a group of integrated functions; it would be better to speak of "mental organization." In this way Gall anticipates the work of Darwin in breaking down the absolute distinction between animals and man: he also inclines to reject subjective psychology, and put in its place the analysis of conduct which we now call objective psychology or behaviourism. But he did not accept the

traditional views that the mind is a compound sensation or entirely dependent on sensation: he upheld the doctrine of natural dispositions: he says, "the senses are not the immediate generators, but merely the mediators of mental qualities; they conduct external impressions to the brain which receives, digests and reproduces them according to its own energy."

According to Gall there is no such thing as intellect or memory, and therefore no possibility of localizing them. They are terms which apply to modes of action and vary with the specific type of development.* Similarly attention is not a faculty: he says: "We are attentive to what pleases us: and what pleases us is what is agreeable to our organization. Without emotion there would be no attention: but while emotion lasts so does attention."

Gall insisted that the brain is not a unit but a complex aggregate of organs. This doctrine is the outcome of the principle of localization, which was first enunciated as localization of the sensory centres. From the general principle Gall deduced the doctrine that whenever a mental power is highly developed there is a corresponding local development in the brain. With this axiom in mind he examined the skulls and brains of composers, tone-deaf people, geniuses, idiots, spendthrifts, misers and so on. Here the question arises whether Gall had any satisfactory classification of mental powers to use in his investigations, and whether it was possible to extend the general principles about size and convolutions to such complex qualities as covetousness, or philoprogenitiveness, or to limit amativeness to the cerebellum. The answer to both questions seems to be negative and Gall cannot be acquitted of out-running the evidence in his statements.

The relation of the cranium to the brain has been a stormy point of discussion between Gall's friends and enemies. O. W. Holmes said inspection of the skull was like "telling the number of a bank note inside an iron safe by feeling at the knobs outside." The defenders maintain that brain development does determine the shape of the skull: but apparently they abandon any attempt at a point to point correlation and virtually make no effort to expand the general doctrine of extreme size or smallness to that of specific "bumps."

The curious fluctuations in the history of Gall's theories can be made intelligible by a simple explanation. Gall himself explains the origin of his ideas from crude observations to which he was led by the fact that he was himself easily surpassed in any tests involving verbal memory. In order to explain this fact Gall undertakes to show that a faculty of this kind is a distinct anatomical peculiarity and is congenital. In the false light of this inspiration he conducts intense and elaborate studies of the brain, which being purely experimental were not actually affected by the theory and have proved independently valuable.

Many of the greatest discoveries have been made during a search for some imaginary nonexistent entity, as, for example, the North West Passage, or the *a*-point of gravitation. Gall has suffered because his theories were wrong while many of his results were right. His work ultimately falls into three divisions—craniology, organology, anatomy. The craniology contained an element of truth, and in the form of physical anthropology it has taken on a scientific character: but there is no evidence that Gall employed any of the modern principles of measurement.

The organology was never of any value because of its purely deductive character. But its outlook was effective in later physiological psychology by the very fact that it drew attention to the great complexity of such functions as memory. Gall was driven theoretically to find a mental value for every fibre. The task was impossible, but on the way he struck the idea that mental functions are conditioned by motor and sensory factors. Ribot and James capitalized this in the doctrine of types, *e.g.*, motile, tactile, visual, etc. The anatomy has been described above and may be left to justify itself.

* *e.g.*, visual memory.

A CANADIAN NATURALIST; JOHN HUTCHISON GARNIER OF LUCKNOW*

By A. J. Mackenzie, M.D.

Toronto

Even in our land, so young and so practical in its outlook, there have been developed men who, perhaps unconsciously, were brave enough to differ from the common standard, to follow the leadings of their own fancy and imagination, and to walk unmindful of the dictates of custom and fashion, of the criticism of oddity and eccentricity. Chiefly in the country places, where man can see the horizon and feel nature, not as a holiday experience but as life itself, where the throng does not press so close, and where the ear and eye are not dimmed by its everlasting chatter and motion, do such men develop, as the lone pine, not the one in the forest, takes on the weird conformation that charms us in a Japanese print. Mass production in life, as in manufacture, results in the deadly monotony and ugliness of the ready-made and stifles the vagrant and sportive tendencies from which so often grow originality and, now and then, genius.

Such a one was the author of the little book which I have given to the Academy, found by luck in a pile of ten cent discards outside Britnell's; the strange work of a country doctor whose life and pursuits and daily round were so foreign

* Read at the stated meeting, Academy of Medicine, Toronto, on January 4, 1927.

to the theatrical prancings and pratings of Spanish hidalgos, and whose surroundings of simple Ontario farm scenery were so remote from the dusty sun-baked plains, and barren mountains of the land of Don Quixote.

As a boy I knew Dr. Garnier as a sort of country legend, a strange eccentric man that we mixed up with the fays and wraiths of the Highland legends still heard among the Gaelic farm people, a name to awe the childish mind as one who wielded a power, if not supernatural, at least eerie. We saw him drive past with his fast pair, his hounds running behind his buggy, his gun on the seat beside him with which he would bring down a bird on the wing. We knew of the collection of snakes in bottles in his study with which he would awe and impress the nervous woman who came to consult him about her stomach. A legend was abroad of the most miraculous cures he wrought when called as a last resort here and there throughout two counties, almost as startling as the stories of charms dealt in by the wise old Irish and Scotch women. I know little of his real ability, but believe he must have possessed an acumen akin to genius, for all his reputation was not founded on his oddities, or the profanity with which he shocked a God-fearing community.

My friend, Dr. Fred Colling, who was a school boy in the village, tells of his bursting out in a lurid expletive storm on a group of urchins who were stealing his apples and capturing him (Dr. Colling), bringing him in, shivering in dread of strange tortures and showing him all the entrancing treasures of his collection of snakes and frogs, and enlisting his services in capturing specimens in the adjacent swamp. I remember hearing of his shooting from his window a neighbour's pig that dared to make its way into his garden, and sending a shower of duck shot about the legs of a worthy citizen who tried a short cut among his flowers.

But I did not know, and the simple villagers did not recognize, that he was their chief citizen, their proudest flower of civilization, although he dared to swear like a cattle-drover, and never went to church. He was a lover of flowers, one of the first importers of bulbs from abroad, and his garden was a place of rare beauty; his collection of reptilia was the most complete in the land in his time, and was given by him, a real gift to science, to the University of Toronto to form a nucleus of the museum of the Department of Biology, where it can still be seen, arranged and catalogued by his own hand. He was a distinguished ornithologist, recognized as an authority, and upwards of seven hundred specimens of Canadian birds from his collection can be seen in the Ontario Museum on Bloor Street, where the Curator showed me a whole armful of his manuscript studies written out in long hand on foolscap. He corresponded with learned societies and exchanged specimens with other students as far afield as India.

This small book represents another phase of his intellectual attainments. It is entitled "Prince Pedro," was published in Toronto in 1877 and was dedicated by permission, in the old fashion, to the Governor-General Lord Dufferin. It is a historical drama with the action placed in Portugal at the time of the Moorish wars, and is written after the Shakesperian fashion, the knightly class speaking in blank verse and the humbler actors in prose. I cannot say that it has extraordinary literary merit, though the construction and vocabulary are of a high order and two of the songs have some poetic worth. The plot hinges on the forging of a will by the wicked Abbot of Cintra by which he gets possession of an estate and ousts the lawful heirs. There is plenty of action, daggers and lances are freely used, and the finale is the burning at the stake of the malefactors. Its interest and value to us is that it is a memento of one of our own profession who, as a country doctor, found the time and had the ability to be not only a distinguished naturalist, but an ambitious author.

A few facts as to his life are as follows: He was born in Scotland of Irish parentage over seventy-five years ago and was educated in Dublin, where he graduated. In his student days, he was personally acquainted with Daniel O'Connell and was fond of recalling incidents in the life of the great Irishman. After graduating, the deceased spent several years in travel, including some time in India and Cape Colony and in the early fifties came to Canada where his brother, now postmaster-general of the Cook Islands in the South Pacific, was living, and together they explored every part of "the bush" encountering numerous dangers by the way. He practised for a few years at Hagersville, Ontario, and about the year 1860, removed to Lucknow in Bruce County, where he resided continuously from that time until his death on February 1, 1898.

FLORENCE NIGHTINGALE*

Our readers will recall the appearance, in the year 1913, of the *Life of Florence Nightingale* in two volumes by Sir Edward Cook. Based on a mass of first hand evidence in the form of personal diaries and publications, private and official correspondence, government reports and blue-books not previously accessible and for the first time welded into a coherent and accurate whole, this book was a real event in its field; for it reconstructed the life-history of one of the great characters of the nineteenth century, and revealed the true foundations of her immense popularity. The old romantic version of the "Lady with the Lamp," whose single-minded devotion to the alleviation of suffering carried her to the bedside of the sick and dying soldier

* *A Short Life of Florence Nightingale*, abridged from the Life, by Sir Edward Cook, with additional matter by Rosalind Nash, 403 pages, illustrated. Price $3.50. The Macmillan Company, Toronto, 1925.

in the East, there to minister to his needs with the tender sympathy and gentle care that is ever the function of true womanhood, was discovered, in the light of all this documentary evidence, to be entirely inadequate. This picture, true as far as it went, and dear to the hearts of the British people in that hour of national stress, revealed only one side, covered only a short period, of a life so crowded with vast humanitarian achievements that the Crimean episode stands out, in true perspective, as but an incident, which had its highest value in its influence in high places, rich associations, and the hard experience it brought Miss Nightingale, through which she rose to wider statistical investigations and to more far-reaching sanitary reforms.

Sir Edward Cook's *Life* did its part well, for it was widely read, and the revelation which it made of the life and work of Florence Nightingale has passed into history. But the material from which it was compiled was so great, and the necessity for quoting fully from authoritative sources, was so imperative, that it is necessarily a work too bulky and voluminous for the average reader, or for textbook use. He himself contemplated issuing a shorter work, which should be "not merely an abbreviation but a new book" based on the first edition. This intention he did not live to fulfill, but it has been carried out for him in the "Short Life" before us, by one who may in the truest sense of the word be considered for this purpose his literary executor. Mrs. Rosalind Nash, its author, is the sister of Dr. S. Shore Nightingale, and is probably Miss Nightingale's closest living relative; and admirably she has fulfilled her task. The book is not merely an "abridgement," but contains considerable new material. In a compact readable volume of 376 pages (exclusive of appendices and the excellent index), the facts garnered from the researches embodied in the "Life" are recounted, with an elimination of unnecessary detail and an emphasis on the high lights, so to speak, of personality and events, that make a fascinating biographic tale. The book begins with the portrayal of Miss Nightingale's happy youth and childhood passed in an atmosphere of culture and refinement that supplied a "background" which she never lost. Her early struggles amid the affectionate limitations of her Victorian home towards the vocation that she felt was hers, and the preparation for this that she wrested from her relatively scant opportunities make a sympathetically told story, while the triumph achieved by her during the Crimean struggle not alone in bringing care and comfort to the half frozen and wounded soldiery, but also in the reduction of the mortality from 437 to 22 per 1,000 by drainage and reconstruction of the vast pest-house that was her hospital, will always excite admiration.

After her return to England she laboured incessantly to the end that the necessary reforms might be set in action while the memory of the Crimean abuses were still hot within the public mind, working by means of personal interviews and correspondence, statistical studies and confidential reports and numerous published articles to secure the formation, and then direct the action, of a Royal Commission for investigation and reform. Out of this Commission came: (1) the Army Medical School at Woolwich, of which Sir James Clark wrote: "For originating this school we have to thank Miss Nightingale, who, had her long and persevering efforts effected no other improvement in the Army, would have conferred by this alone an inestimable boon upon the British soldier"; (2) the reform of barrack and army hospitals; and (3) the reorganization of army medical statistics (with the co-operation of Dr. William Farr).

After Lord Herbert' death, the reform in civil hospital construction with the introduction by her of the pavilion system, and of statistical forms for hospital use, and her vast labours for the improved sanitation of India occupied her chief energies, although at the same time she was supervising the organization of the Training-School for Nurses at St. Thomas' Hospital, which held as its basic principle the dictum that its probationers were to be taught to be "trainers of the trained." Last, but not least, that colossal burden of workhouse infirmary reform that was carried on through much hardship and great personal sacrifice by Nightingale nurses under the direct counsel and guidance of their "Chief." All this and much more is told.

The genius of Florence Nightingale was essentially modern, and the far-reaching results of her immense activities have become an integral part of our twentieth century civilization, while the doctrines of which she was an apostle, of light, fresh air, and sunshine, pure hygiene and strict sanitation, personal cheerfulness and instant service, are now elementary principles of hospital administration and discipline. She was, too, a very human character, with powers of intellect that indeed transcended sex, but withal of undimmed femininity, and endowed with that true womanliness of heart that had made her the idol of the British soldiery. Yet she denied herself, through all her later life, all social intercourse or relaxation, in order that she might reserve all her scant strength for her work and her co-workers. Such a life may seem arid and even hard to those who do not know the stakes, nor the intensity of her service, but this was not the least heroic part of a life of heroism.

One omission in this "Short Life" we have noted with regret, and that is the entire absence of the fine bibliographies of "Miss Nightingale's Writings" and "Writings about Miss Nightingale" with which the longer "Life" closes.

But this is our only criticism, and it is rather a suggestion. The typography is clear, the book-making excellent, light, and durable and the contents are enriched by a fine illustration from the pencil sketch by Sir George Scharf in the National Portrait Gallery that has not appeared elsewhere. It is completed by a good index. The book will make a strong appeal to a very sympathetic public.

MAUDE E. ABBOTT

XUM

Miscellaneous

THE STORY OF THE THYROID GLAND

In an interesting address by Sir John Linn Thomas before the South-West Wales Division of the British Medical Association, the etiology of goitre was discussed and the story of the part played by iodine related.

So recently as 1883, that year's edition of Michael Foster's text-book on physiology contained no reference to the physiology of the gland, and only late in this year was attention drawn in Switzerland to post-operative myxedema.

Although so early as 1874 Theodore Kocher published his first paper on the pathology and treatment of goitre, in which he described his first thirteen goitre operations, it was not till April 1883 that he read the first paper on the consequences of total thyroidectomy at the German Surgical Congress, calling the disease *cachexia thyreopriva*. After this report he began to follow his cases of total thyroidectomy with transplantations of pieces of thyroid gland in different parts of the body. Unfortunately, the effect was only temporary. From that time to 1890, all cases of goitre in the Canton of Berne were carefully investigated and studied by him. He examined thousands of school children, and in 1889 published a map showing a close connection between the geological formation of a district and the distribution of goitre, and in a public lecture he urged the government to order that the drinking water in all public schools should be boiled, or to have iodine added to it to prevent goitre. In 1892 Kocher published his first paper on the origin and prevention of cretinism, and described a case of congenital goitre with cretinism, and proved that cretinism was due to a lack of thyroid function, and could be prevented by the same measures as those which prevent goitre. This point of view was for some years strongly opposed but has nowadays become the general opinion. In 1895 he read a paper on the action of iodine in goitre, and in that paper suggested that the normal thyroid gland contains iodine. A year later Baumann in Freiburg published the first definite statement on the iodine content of the normal gland. In 1906 Kocher gave one of the annual orations before the Medical Society of London. (*Brit. M. J.*, 1906, 1, p. 1261.) This work was the starting point of modern endocrinology, and contained all that we know at present of the pathology of this gland. In 1909 he was awarded the Nobel prize for his research work, and especially for the discovery of the function of the thyroid gland, and in that same year read before the Academy of Medicine in Stockholm in which he drew his classical picture of the minor functional troubles of the thyroid gland, hypo- and hyper-thyroidism. In 1910 Kocher gave the classical picture of *iodbasedov* showing that the use of iodine can produce Graves disease in certain forms of goitre, and drawing attention to the harm that may be done by the use of iodine in certain forms of goitre. It is worth while thus to recall all the advance in our knowledge about the thyroid gland for which we are chiefly indebted to Theodore Kocher. It is noteworthy that Theodore Kocher never made any fantastic statements but only drew conclusions which he could definitely prove, giving entire credit to all those who had assisted him. The speaker expressed not only his own but the obligation of all the profession to Theodore Kocher for the secure foundation laid by him regarding the surgery of the gland. The notes from which the above facts were drawn were supplied by Theodore Kocher's son. The speaker went on to say that Theodore Kocher had in many ways shown himself possessed of good scientific judgment, and especially valuable was the expression of his opinion so long ago as in 1889 in popular lecture that the cause of goitre was to be found in the drinking water, and urged the government to have all drinking water in the public schools boiled, or else add iodine to it. Goitre is found in almost every country in the world, from the sea level up to 10,000 feet above it, wherever soil exists for man to live on. It is fairly common in the counties of Wales bordering on the sea, and is found in inland districts.

Professor Fleure of the University College of Wales adds to the above the following remarks: "While we have made observations, as conscientiously as possible, on goitre I cannot say they have led to any very clear conclusion as to its exact etiology. We find that the administration of iodine has been undoubtedly valuable in a number of cases. Whether the importance of this is the direct contribution of iodine to the system, or whether the iodine acts as an enemy to some factor of the disease we do not presume to say. In connection with this we have placed the insistence on boiled water as very important. Along with these curative measures we deem it desirable to take measures to maintain and develop resistance in the patient, by securing sunlight, giving attention to bodily hygiene and by the use of diet containing green vegetables and fruit.

THE TRAINED NURSE AS A STORM CENTRE OF DISCUSSION

The nurse is indispensable in any kind of medical work that amounts to anything, and especially so in institutions. Discussion, animated, sometimes excited, busies itself with questions of her training, qualifications, field of work, hours, pay, motives, attitude. Physicians complain that she is hard to lure to the bedsides of private patients, that she is too often overtrained in theory, unduly professionalized, lacking in practicality and docility. Families find fault with the amount of her salary, the limitation of her hours, and her unwillingness to lend a hand in domestic tasks. Few people of modest means can afford to have her at all.

The hospitals, too, cherish a grievance. They give her a sound training only to see her desert the wards to do public health nursing, school nursing, industrial hygiene work, and the like. Some of the smaller hospitals, especially, are quite bitter about this exodus. One of the most frequent complaints has to do with educational requirements. These are declared to be uselessly high, too theoretical and professional, and a chief cause of keeping numbers low and costs high. All the plaintiffs tend to picture the nurse as something of a profiteer who has lost the Florence Nightingale spirit of sacrifice and service.

What has the defendant, the graduate registered nurse, to say about these indictments? Here are some of the things she believes ought to be considered. Her education has cost her time and some money—actually a substantial sum if what she might have been earning in other work is taken into account After an elementary school course, and often one or more years of high school, she has spent three years in a hospital. She thinks that during her period of training the hospital had a good deal of work from her on fairly cheap terms. When she has finished her course she feels that she has the right to choose between continuing in hospital service and entering the fields of private nursing or salaried public health or institutional nursing.

From this point she can hardly be described in the singular. A good many nurses fall into hospital routine and remain in spite of often rather irksome conditions of work, residence, and discipline. They cannot agree that the pay is excessive when their hospital duties and responsibilities towards pupil nurses are fairly appraised.

The nurse's income from her work alone never leads to more than a reasonably comfortable living, and if she fails in health or loses much time because of vacations or enforced idleness she is immediately in economic danger. But little can be saved up for such matters as insurance and old age.

It is not strange, therefore, that long-headed young women with a liking for responsibility enter readily into the salaried service of public health work. Here they find continuous income, fixed hours, certain individuality and the satisfaction of rendering service to large groups of needy people. If the nurse seems to lack something of the spirit of those women who are in religious orders it is because they are not provided for in like manner by society—a competence for old age and peace and security of mind and body.—*American Medicine*, December, 1926.

THE REVENGE OF TIME

At last the $24.00 which was paid to Indians for the island of Manhattan is beginning to bear interest, and one of those strange examples of approved social theft has turned out to be a boon to the victim. The Indian has become rich. Statistics show that the per capita wealth of the American Indian is nearly twice as great as the per capita wealth of the other citizens of the country and is much greater than the per capita wealth of any other people in the world to-day. "For example," reads an authentic report, "the per capita wealth of the countries involved in the World War was approximately $800.00. The per capita wealth of the people of the United States is less than $2,500.00. The per capita wealth of the American Indian is approximately $4,700.00." In other words, the Indian is now twice as rich as his white compatriot, man for man. And with the coming of wealth his whole status has changed. Where once Indian communities were disease-ridden and decimated, they are now healthy and constantly on the increase. The "vanishing race" is a thing of the past. From the white invader, he had acquired only the worst vices of the new civilization: drink, gambling and disease, and these were rapidly thinning his numbers. After more than a century of mistreatment, the white man at last decided it was time to show a little kindness, and so he assigned a restricted territory in which the Indian was to make his home. Destiny is a strange thing and plays curious pranks. It was the intention of the white man to commit the Indian to obscurity, but Fate took a hand and has made the Indians the wealthiest in the country. The territory assigned to them is among the richest in the land, abounding in oil, and the few Indians of caste who previously had to content themselves with the honour of such titles as "Chief" and "Princess" now are riding about in their Rolls-Royces, handing out millions to white men's churches, and enjoying wealth such as their forefathers never dreamed of (*Am. Med.*, December, 1926).

THE INCREASING INTEREST IN MEDICAL HISTORY

It is of no little significance that physicians the world over are giving more attention to medical history. In a recent issue the *New York Times* announced the appointment of Dr. William H. Welch, senior member of the Johns Hopkins

medical faculties, to a full-time chair in the history of medicine of that university. Dr. Frank J. Goodnow, president of the university, said that it was the first endowed professorship of its kind in America. Dr. Goodnow, in making public a gift of $200,000 from the General Education Board for the establishment of the new professorship, stated that its purpose was to provide medical students with a cultural background which will make the young physician "more than a technical machine, competent to practice medicine." "Although a knowledge of medical history is often considered chiefly as an ornament in the case of a physician," said Dr. Welch, "it is more than that. It is an asset to successful practice and to the pursuit of medical science." In illustration of what a historical background can mean to a medical man, Dr. Welch declared that the late Sir William Osler, one of the outstanding physicians of all time, "was a man whose knowledge was very largely based on the history of medicine."

"Already," stated Dr. Welch, "we have some very good workers in this country in the field of medical history. Colonel Fielding Garrison, who is in charge of the library of the Surgeon General of the Army. Dr. Harvey Cushing of Harvard, in addition to his work in surgery, is a very important figure in the field of medical history, and Dr. Frederick Packard of Philadelphia, editor of the 'Annals of Medical History,' Dr. Edward Clark Streeter of Boston and several other Americans are now making notable contributions in the field of research in medical history. I think a great deal can be done in developing medical history as a part of the instruction of medical students. There has always been but one goal in medicine, the prevention and cure of disease. That gives a unity to the history of medicine. It has a unity and continuity which, I think, few other subjects have."

Dr. Welch has resigned from his position as director of the Johns Hopkins School of Hygiene and Public Health, and has been chosen for the new professorship, according to President Goodnow, "because of his intense interest in, and his knowledge of the historical background of modern medicine" (*Am. Med.*, December, 1926).

GOITRE IN EDMONTON (1820)*

Dr. John Richardson accompanied Sir John Franklin in his Journey to the Polar Sea. In February, 1820, he visited Edmonton. The following remarks are from his diary:

"Bronchocele, or goitre, is a common disorder at Edmonton. I examined several of the individuals afflicted with it, and endeavoured to obtain every information on the subject from the most authentic sources. The following facts may be depended upon. The disorder attacks those only who drink the water of the river. It is, indeed, in its worst state confined almost entirely to the half-breed women and children, who reside constantly at the fort, and make use of the river water, drawn in the winter through a hole in the ice. The men, being often from home on journeys through the plain, when their drink is melted snow, are less affected and, if any of them exhibit during the winter, some incipient symptoms of the complaint, the annual summer voyage to the sea-coast generally effects a cure. The natives who confine themselves to snow-water in the winter, and drink of the small rivulets which flow through the plains in the summer, are exempt from the attacks of this disease. . . .

"A residence of a single year at Edmonton is sufficient to render a family bronchocelous. Many of the goitres acquire a great size. Burnt sponge has been tried, and found to remove the disease, but an exposure to the same cause immediately reproduces it.

"A great proportion of the children of women who have goitres are born idiots, with large heads, and the other distinguishing marks of cretins. I could not learn whether it was necessary that both parents should have goitres, to produce cretin children: indeed, the want of chastity in the half-breed women would be a bar to the deduction of any inference on this head."

* Everyman's Library, p. 108.

MEDICAL TEACHING IN CANADA IN 1824 AND 1834

IV.—From Colonial Advocate, Aug. 19, 1824, Advertisement

MEDICAL SCHOOL AT ST. THOMAS,

In the Talbot Settlement, and under the immediate patronage of the Hon. Colonel Talbot.

Notice is hereby given that a medical School is opened at St. Thomas, in the Talbot Settlement, under the direction of CHARLES DUNCOMBE, Esquire, *Licentiate*, and the immediate patronage of THE HONOURABLE COLONEL TALBOT, where the Education of young men for the profession of *Medicine* and *Surgery* will be carefully superintended, and every opportunity afforded them to become intimately acquainted with the structure and physiology of the human body.

Every student before admission is expected to have a complete knowledge of the *Latin* language, or to give satisfactory assurances of immediately acquiring it; for which purpose *A Competent Teacher* will be resident in the village.

CHARLES DUNCOMBE will give a course of *Lectures on the Theory and Practice of Medicine.*

JOHN ROLPH is expected to give the first course of *Lectures and Demonstrations*, during the ensuing season, on the *Anatomy and Physiology of the Human Body.*

To the Honble. Col. Talbot, Port Talbot.

Sir.—The committee presidents are to be for the future annually elected by subscribers. During the concourse of the election under your patronage and the conjunction of all the candidates, it is thought we can commence with advantage, give an impulse to public feeling on the subject, and receive annual subscriptions. The introductory Lectures might then be given with advantage in Public.

Dr. Duncombe will call upon you to learn your pleasure on the subject.

There are many arrangements as to the nature of the Lectures which cannot be well suggested in this letter.

I have the honour to be, my dear sir,
Your most faithful servant,
John Rolph

St. Thomas, August 5, 1824.

In the Kingston paper of July 22, 1834, there appeared the following:

Kingston, Upper Canada, Medical Academy

Under the Auspices and Patronage of the Lieutenant-Governor, Sir John Colborne.

Mr. Colls, Surgeon, Royal Navy, will open an establishment on August 1. His terms are as follows: With board and lodging, washing etc., £100 per year; without board, etc., £50.

The gentlemen will be taught with great care the duties incumbent upon them as professors of the general science, in every branch, theoretically and practically. Their morals will be carefully watched, and their religious duties will be impressively enforced upon them according to their tenets. They will be taught Anatomy, Surgery, Medicine, Midwifery, etc. Lectures will be daily given.

Mr. Colls will teach the following languages, with which he is well acquainted: French, Spanish, Portuguese, Italian and Dutch. These will be gratuitous. £25 will be required in advance as an entrance fee, part of annual payment. July 22, 1834.

This appeared in the Cobourg *Star*, October 21, 1832: Dr. Rees, professionally educated in England; pupil of Sir Ashley Cooper, and ten years a practitioner in the Canadas, respectfully tenders his services to the inhabitants of Cobourg and vicinity.

Later an advertisement appeared in a Toronto paper.

To Medical Students.—In pursuance of a plan for establishing a School of Medicine in this city, Dr. Rees proposes to deliver a course of lectures on Obstetrics and the Diseases of Women and Children, on the first Monday in November next. Anatomy, Physiology, Surgery, Materia Medica, the principles and practice of Physic, Chemistry and Medical Botany are the subjects which will be comprehended the ensuing season.

Arrangements necessary with the other medical gentlemen will be determined by the 1st of October, when a prospectus and further particulars may be had on application as above (postpaid).

Toronto, August 4th, 1834.

In Toronto, in the year 1843 "Rolph's School" started. Here are two notices which appeared:

Medical students, who do not intend to enter the university, will be, as heretofore, received by the subscriber, conducted through the usual course of medical studies, with such additional assistance as may be most desirable, and prepared for their diploma from the Medical Board.

"John Rolph.

Lot Street, January 1, 1844.

"Toronto School of Medicine.

"The session will commence on the last Monday in October, and end on the last Saturday in May, under Dr. Workman, Dr. Park and the subscriber.

"John Rolph.

Toronto, September 25th, 1848.

Toronto was again the place chosen for another Medical School.

School of Anatomy, Surgery and Medicine, under the immediate superintendence of D. Lithgow, M.D., Etc., Etc., of the University of Edinburgh.

Dr. Lithgow, having taken that large and central brick building, No. 17 Newgate Street, will open it as a general School of Medical Science early in the month of November. It shall be conducted on a plan precisely similar to those institutions in the Old Country, which have acquired such deserved celebrity from the professional gentlemen educated in them. During the season lectures will be delivered upon Anatomy and Surgery, Physiology and Medical Jurisprudence, Materia Medica, Chemistry, Practice of Physic and Midwifery.

The Anatomical Demonstrations will be under the direction of the Licentiate of the Royal College of Surgeons, Dublin; the other courses of lectures by medical practitioners in extensive practice and of acknowledged talent, particulars of which will be made known hereafter.

The session will be opened up on Wednesday, 12th of November, by the delivery of a short course of lectures upon 'The Duties and Qualifications of a Medical Practitioner,' by Dr. Lithgow.

Further particulars may be known by application to Dr. Lithgow as to terms of indoor or outdoor pupils, terms of lectures, etc.

Toronto, September 24, 1834.

H. C. Jamieson

XUM

ACKNOWLEDGEMENTS

The January number of the *Manitoba Medical Association Bulletin* contains an address on the late Dr. Gordon Bell by Dr. E. W. Montgomery, delivered on the occasion of unveiling a memorial tablet at the Gordon Bell School, Winnipeg. It is always stimulating to be reminded of the lives of such men as Gordon Bell. He presented a many-sided mind with a character described by Dr. Montgomery as vigorous, adaptable and original; but a more complete summary of the qualities which left so deep an impression on his generation may be found in the statement of his "absolute fairness to all and unfailing constancy to his friends."

Some slight alterations have been made in the cover of the *Bulletin of Hygiene*, resulting in more agreeable appearance, and also in emphasizing its world wide scope of work. There are also some improvements in the arrangement and size of the type.

In the February number of the *Vancouver Medical Association Bulletin* we note a report on an unknown organism causing fatal meningitis in infants. This organism, a Gram-negative form varying from a coccoid to a rod shape was readily grown on ordinary media, and it is stated that as far as could be determined, it had not been described in literature. It was found in four cases.

The February number of the *Canadian Lancet and Practitioner* contains a timely editorial on the subject of health education. Sir Thomas Horder is quoted as advising that the public be given information on all subjects connected with health and disease. He thinks that instruction in these matters should be given by experts, and that some responsible body should exercise control of such information and the publication of such information. Additional channels such as the press, books, the moving picture and broadcasting should also be employed. At the same time Sir Thomas Horder is conservative on the question of publicity by any particular doctor, particularly in the matter of signed articles.

Correspondence

TISSUE DIAGNOSIS IN THE OPERATING ROOM

And Immediate Cover-slip Examinations of all Fluids and Pus

To the Editor:

Microscopic examination of stained frozen sections has been possible for more than a quarter of a century. The staining of unfixed frozen sections with polychrome methylene blue and other stains is a well-established procedure. In many operating rooms in university and other large and small surgical clinics, provisions for these immediate diagnostic studies have not only been available, but have been in practical use for years. Unfortunately, on the other side, this diagnostic part of the operating room is conspicuous by its absence in many clinics.

Before 1915 it was rarely necessary for a surgeon well trained in gross pathology to need a frozen section to help him in diagnosis at the operating table. Since 1915, and especially since 1922, the public has become so enlightened that malignant disease formerly easily recognized clinically or in the gross, now appears in our operating rooms devoid of its easily recognized appearances and can only be properly discovered by an immediate frozen section. The majority of operating rooms are not equipped or prepared for this new diagnostic test.

An essential for this diagnosis is the service of a trained technician—one to cut and stain the frozen section, or to make and stain the smear. A second essential is the assistance of a pathologist trained to interpret the specimen. It is possible for the surgeon to be all three in himself, and some young surgeons are so equipped. In other hospitals it is a dual combination—surgeon and pathologist in one, and a technician. More frequently all are present—operator, technician and pathologist. It makes little difference whether there are one, two or three individuals, for the investigation, providing the equipment and training for this most difficult diagnostic test exists.

In the address as chairman of the surgical section of the Southern Medical Association, I discussed biopsy, and my paper has been published in the *Southern Medical Journal* for January, 1927, xx, 18. A reprint will be sent to anyone on request. The chief object of the present letter is to invite surgeons and pathologists who are sufficiently interested in this problem to discuss it either by correspondence, or by attending a meeting in the surgical pathological laboratory of the Johns Hopkins Hospital, either on the Monday before, or the Friday after the meeting of the American Medical Association in Washington.

Schools for technicians may have to be established in different sections of the country, and the surgical pathological laboratories of the medical schools and the larger surgical clinics should offer courses in this tissue diagnosis, so that surgeons may learn to become their own pathologists, or pathologists learn the particular needs of the surgeon in tissue diagnosis in the operating room.

It is quite true that when the majority of the public are fully enlightened, the surgeon will see lesions of the skin and oral cavity and the majority of subcutaneous tumours when they are so small that their complete excision is not only indicated, but possible without any mutilation. The chief danger here will be a surgical mistake—the incomplete removal of an apparently innocent tumour. There is no necessity here for biopsy. If a proper local excision is done, no matter what the microscope reveals, that local operation should be sufficient. But when lesions of the skin, oral cavity and soft parts are extensive and their complete radical removal mutilating, then there must be biopsy to establish the exact pathology.

In tumours of the breast and disease of bone, in past years, the diagnosis could be made clinically, or from the gross appearance at exploration. But now, in an increasing number of cases the breast tumour must be explored, and the gross pathology of this earlier stage is not sufficiently differentiated to allow a clinical diagnosis. Immediate frozen sections are essential to indicate whether the complete operation should be done. The same is true of lesions of bone in their earliest stages. The x-rays no longer make a positive differentiation between many of the benign and malignant diseases; for example, sclerosing osteomyelitis and sclerosing osteosarcoma.

There is a final and difficult question to consider. What can be done in those operating rooms in which there is no technician to make the sections, and no one trained to interpret the microscopic picture? How can a piece be excised or a tumour removed, for example, from the breast, and this tissue sent to some laboratory for diagnosis without incurring the risk of delay to the patient. I have discussed this point in my paper on biopsy.

JOSEPH COLT BLOODGOOD,
Surgical Pathological Laboratory,
Johns Hopkins Hospital
Baltimore, February 3, 1927.

London Letter

(*From our correspondent*)

The London Blood Transfusion Service.—With the establishment of blood transfusion as a most important adjuvant to surgery the difficulty was soon discovered that in a big place like London suitable donors for emergency cases may not be at all easy to obtain. Many hospitals have their own lists of donors for emergency cases, but it sometimes happened that no member of a required group could be obtained at a given moment and so in 1921 a branch of the British Red Cross Society organized a blood transfusion service which grew so rapidly that on January 1, 1926, the Society itself took over officially a service which supplied the amazing total of 736 donors during the year 1926. The organization is now very complete and the following details may be of use to hospitals in other centres. An office has been taken and a day and night continuous service instituted. Arrangements have been made for facilitating all telephone calls and volunteer donors have been obtained mostly from Rover Scouts, the remainder being recruited from Red Cross workers, the Y.M.C.A., Toc H, Crusaders and individuals unconnected with any special organization. At first it was intended that donors should only be sent to the hospitals, but it was found that private cases, for other than financial reasons, frequently required the services of a donor, particularly at night, and although no charge is made even in these cases, numbering about thirty, donations ranging from two to ten guineas have been received and as a result the service has been rendered self-supporting financially. The service pays all the expenses of donors such as conveyance, time lost from business, refreshments and special nourishment afterwards should this be required. On an average a volunteer can be supplied within half an hour of a call but it has frequently been done in less than ten minutes. Volunteers not on the telephone are summoned by telephoned express letters, by the courtesy of the police, or by telephoning night taxi-cab ranks to call on the donor and convey him direct to hospital. Most of the calls are for group four donors, and on an average, donors in this group have served about four times during the year while the other groups have been required about once each. The Honorary Secretary is in group 1, his wife in group 2 and his son in group 3, so there is always someone available from the first three groups for an emergency call. No donor has ever been any the worse for the transfusion and out of the 1,250 cases in the history of the service there only have been eight "bad arms." The British Red Cross has every reason to be proud of this extremely useful and efficient service.

The Problem of the Cancer "Expert".—It is curious how some diseases appear to attract the imagination of the journalist, and of these diseases tuberculosis and cancer certainly head the list. The recent "exposures" of Mr. H. Spahlinger and his tuberculosis cures in a prominent London daily has been a great attraction, while at the same time fierce controversy on the same matter is raging in the more sedate columns of the *Lancet*. As far as cancer is concerned it would be thought that any instruction of the

public on how to fight the disease would be received with unmixed journalistic blessing, yet Sir Berkeley Moynihan's Hasting Lecture on "Cancer and how to Fight It," a masterly review of how the public should face the cancer problem in its present position, did not at all please certain newspapers, mainly on the grounds that he frightened his audience too much. The lecturer, however, stated quite clearly that he did not think it possible to increase the already widespread fear of the disease, and any further enlightenment could only act in the direction of encouraging people to seek advice, while the disease was in a curable, that is, a removable condition. Another recent contribution to the study of the cancer problem, which was received in a curiously mixed fashion, is the Ministry of Health's report on "Diet and Cancer." It has become increasingly the fashion in recent years for certain "experts," both medical and lay, to set out pseudo-scientific proof that diet is mainly responsible for the present day high incidence of cancer among civilized peoples, and meat has received most blame. The recent report is devoted to an elaborate statistical inquiry into the mortality rate from cancer in certain monastic communities where flesh food is not taken, and it is proved conclusively that there is no support for the contention that among such populations the relative incidence of cancer is low. Despite this conclusion the "experts" were soon denying the facts, and one great medical authority, who directs the health of the readers of one great daily, tells the public that the Ministry of Health's report is worthless. To take another instance, we find journalists, again both medical and lay, for whom ultra-violet radiation is the cure of everything—under the sun! Of course, cancer is no exception and, therefore, some recent work at the Middlesex Hospital by S. L. Baker and P. R. Peacock will have to be explained away. These workers found that the active agent in the Rous chicken sarcoma (Gye's "virus") will survive a dose of ultra-violet radiation at least five times that necessary to kill most of the ordinary pathogenic bacteria. The amount of first class scientific work on cancer going on all over the world at the present time is surely greater than ever before, and it may be that we are on the brink of a great discovery. What is urgently needed in anticipation of any such discovery is some means of muzzling the pseudo-expert with his pet theory. He is as much a problem to be faced as any pathological or clinical difficulty, for, to have months of hard work dismissed by some Fleet Street scribbler as "worthless" may eventually cause such discouragement that the scientific worker will revolt and leave the newspaper reader to suffer from any disease he may contract from following the advice of whatever expert holds the field.

ALAN MONCRIEFF

Reports of Societies

MEDICAL SOCIETY OF NOVA SCOTIA
HALIFAX BRANCH

At a clinical meeting of the Branch held at the Victoria General Hospital on the fifth of January a number of very interesting medical cases were presented. Dr. Silver showed a woman with aortic aneurism and rather unusual involvement of the cardiac valves. The Wassermann reaction was positive. The difficulty of securing satisfactory results from treatment was explained, and the desirability of encouraging efforts at combating venereal diseases was urged as a logical preventive measure. In such cases Dr. Silver believes that treatment should be commenced with mercury and iodides. Later, arsenicals may be substituted. Dr. Birt and others concurred in this opinion.

Dr. K. A. MacKenzie dealt with two cases of diabetic coma which had come under his care within the previous four days. One was in a young lad who had been supposed to be quite healthy until a gastric upset, which was rapidly followed by marked drowsiness, aroused suspicion and led to an examination which disclosed the picture of diabetes. On inquiry it was found that there had been thirst and polyuria for three weeks. Insulin was at once administered, and, although coma developed, it quickly disappeared. The second case, in a man who was taking insulin, developed in association with a suppurative tonsillitis. Immediate increase in the size and frequency of the dose of insulin was followed by prompt recovery from the coma. Both patients were now in seemingly good condition. In the discussion, Dr. J. V. Graham referred to a diabetic patient in his practice, who had been doing well on insulin until an acute illness came on, when coma developed but yielded quickly to more liberal use of insulin. He emphasized the importance of watching for indications for larger doses of insulin when any complication arises in the course of diabetes. Dr. MacKenzie also presented two cases of hilum tuberculosis. The diagnosis in these cases would have been baffling without x-ray examination. Films were demonstrated showing very encouraging results from treatment.

Dr. S. R. Johnston demonstrated a series of x-ray films of patients who had suffered from chronic constipation, showing distension and redundancy of the colon. Purgatives in such cases

could only do harm. Enemas containing salts or oil had proved very efficacious, as was shown by films made subsequent to treatment.

Dr. Mack reported upon the use of antitoxic serum in the treatment of several cases of scarlet fever which had recently developed in the hospital. In each case there had been prompt improvement in the symptoms. The serum had been administered for prophylactic purposes to a number of members of the hospital staff, and in several instances an unpleasantly severe reaction had followed. In most cases the reaction took the form of a dermatitis with much itching, but in two cases œdema of the glottis had developed and had been troublesome. An interne, who exhibited the dermatitis, was shown.

On January 19th, the speaker was Dr. B. P. Babkin, Professor of Physiology at Dalhousie University. Dr. Babkin's subject was, "The Exogenous and Endogenous Chemical Stimuli of the Alimentary Canal." He pointed out that the motility of the alimentary canal is regulated not only by mechanical factors but also by chemical factors. Under these must be understood the chemical components of the food, or products of its digestion, as well as the different digestive juices. All these substances may be called natural chemical stimuli. The natural chemical stimuli may have different action on different parts of the alimentary canal. They may increase or decrease the motility of certain parts of the gastro-intestinal tube. Thus, acid relaxes the pyloric sphincter when acting from the stomach, while it produces constriction of the same sphincter on being applied to the mucous membrane of the duodenum, etc. The action of these substances may be two-fold, excitatory or inhibitory. One and the same chemical stimulus (*e.g.*, HCl) may increase the movements of the intestine, or inhibit it, or even stop the movements altogether. This phenomenon is due to the differing states of excitability of the alimentary tube. A quiescent gut is stimulated by acid; an active gut is inhibited by it. The natural chemical stimuli have each a specific action. Some of them, as *e.g.*, acids and alkalies, usually increase the rhythmic segmentation of the intestine. Others, as fat and soap, provoke chiefly peristaltic movements. The natural chemical stimuli act not only locally but at a distance, stimulating or inhibiting remote parts of the gastro-intestinal canal. This influence is effected probably not through the nervous channels, but through the blood.

The mechanism of the action of the natural chemical stimuli is not known. Two possible factors must be taken into consideration in explaining their influence: (1) the metabolic gradients of the alimentary canal according to the Alvarez theory of gradients; (2) the presence of cholin in the walls of the alimentary canal and the important influence of cholin on the motility of the gastro-intestinal tract. The interaction of natural chemical stimuli with the cholin or other chemical substances, determining the automaticity of the alimentary canal, may play an important part in the regulation of its movements in normal and pathological conditions.

Professor Babkin's address elicited an unusually interesting discussion, in which several members of the Branch participated. VICTOR O. MADER

TREATMENT OF GANGRENE OF THE EXTREMITIES

At a meeting of the Section of Surgery of the Royal Society of Medicine held on December 1st, Professor C. E. Gask opened a discussion on the treatment of threatened gangrene of the extremities, especially in elderly atheromatous patients, making particular reference to the value of periarterial sympathectomy in this condition. There was no doubt, he thought, that the treatment of senile gangrene either by conservative methods or by amputation was unsatisfactory, and it was therefore desirable to know if this new method was of value. It had been used often enough to allow of some judgment to be formed regarding it. The operation first came into prominence from the work of Leriche, who acknowledged that it was suggested to him by Jaboulay, who practised it in 1899 for the treatment of perforating ulcers of the foot. Designed originally to relieve various trophic changes and obscure pains, such as were included under the title of "causalgia"—disorders assigned to disturbances of the vasomotor system—it had more recently been performed for the relief of thrombo-angiitis obliterans. Raynaud's disease, arterio-sclerotic gangrene, and even for ununited fractures, osteomyelitis, and pelvic disturbances in women. After a brief survey of the factors tending to maintain a sufficient blood supply in the limbs, Professor Gask said that the idea of this operation was to divide the efferent sympathetic fibres and thereby abolish the vaso-constrictor control over the whole of that portion of the vessel distal to the point of division. The hypothesis underlying this procedure had, however, been challenged by physiologists, who denied that the sympathetic fibres ran their whole course with the blood vessels, and found that experimental sympathectomy did not increase the temperature or blood flow in the distal part of a limb. It was important, therefore, to consider what happened when this operation was carried out in the human subject, and Professor Gask recounted his own observations in four cases. In one of these (a Jew, aged thirty-four) the operation was completely successful; it was followed directly by a rise of temperature in the affected limb, the blueness of the leg and the pain disappeared, the patient returned to work, and now (two years afterwards) he was still perfectly well. A partial success might be claimed for another case, and in the other two the patients were not improved, though no harm was done. On reviewing the results of this operation as reported in the literature, he could not help being struck by the more

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or less general agreement with his own results. Sometimes a brilliant success was noted, more often a slight or temporary improvement, and very often none at all. It seemed clear that there was a discrepancy between the findings of the physiologists and the clinicians. Having stated the facts so far as they were known to him, and analyzed some of the hypotheses, it seemed that certain conclusions might fairly be drawn. While the results of periarterial sympathectomy were on the whole unsatisfactory, and in senile gangrene good results were not to be expected, it was followed occasionally by an astonishing and unexplained success. In view of the discordant clinical and experimental findings, further knowledge was needed, both about the distribution and function of the sympathetic system and about the more obscure vascular conditions. What, then, was the correct treatment of a patient with actual or impending gangrene? Should the leg be amputated, or should an attempt be made to save the limb by rest in bed, warmth, and the application of desiccating powders, aided, perhaps, by sympathectomy? Before looking up the literature he was distinctly in favour of this operation; now he had less belief in it. In conclusion he would say that although amputation might be called for in senile gangrene as a life-saving measure, yet it was best to stave this off by every means available Though the work on periarterial sympathectomy might not have helped greatly in the treatment of gangrene, it had not been wasted, since it had broadened knowledge of the sympathetic system and created a bond of interest between physiologist and surgeon—an effect which was bound to be of advantage in the long run.

In the subsequent discussion, Mr. Sampson-Handley pointed out that Professor Gask's results should be interpreted more hopefully. Some degree of success had been attained, and no harm had been done. The variable results might have been due to anatomical variations in the distribution of the sympathetic nerves. He thought that Langley's experiments did not prove the absence of vaso-constrictor nerves in the outer coat of the arteries. He himself had never done sympathectomy, but had instead used periarterial injection of alcohol, an operation of greater simplicity and suitable for cases of actual as well as threatened gangrene. His experience with this, on the whole, seemed to have been encouraging, but he felt that its value was greatest in threatened or actual senile gangrene, although it might be useful in the gangrene of Raynaud's disease. The method, however, should most certainly be tried in senile gangrene before amputation was thought of. Even if it failed it would save a certain amount of the limb from amputation. The injection was perfectly safe, but the danger of absorption of toxic products must be guarded against by early injection, before extensive gangrene had occurred. His method was to inject from two to three minims of alcohol at four points around the artery and into its outer coat.

Dr. Philip Turner also reported some favourable results from this method. What failures he had had were in cases of a very unfavourable type. He emphasized the necessity of using an extremely fine needle for the injection.

Dr. G. E. Slesinger reported equally favourable results from periarterial sympathectomy, the effect of which he thought did not differ essentially from the injection method. The point he emphasized especially was that the operation produced almost unfailing relief of pain.

PSYCHO ANALYSIS AND ITS DEVELOPMENTS

Royal Medico-Psychological Association

A discussion on this subject, held at the last annual meeting of the Royal Medico-Psychological Association, is reported in the *Journal of Medical Science* for October, 1926. In the opening paper, W. A. Potts sketches the development of Freud's position and notes the breach between him and his early associates Jung and Adler. He allies himself with Jung, and asks for clear recognition of the difference between the psycho-analysis of Freud and the psychological analysis of Jung. Analysis cannot be done successfully by one who has not been himself analysed, otherwise "he has only an intellectual experience when an emotional experience is necessary." It is most suitable for neuroses and psycho-neuroses; its availability in mental disorder is uncertain. In some cases of incipient mental disorder it will precipitate an acute condition. And because many so-called neurotics are suffering from diseased teeth or other physical disorder which must first have treatment and which may be cured by such treatment, physicians only should attempt analysis. Two principles, now very generally accepted, are the need for probing back to the very beginnings of disease and the interdependence of mind and body. "The relation of mind and body is shown by the fact that a woman may develop heart disease either because she has been infected with the poison of rheumatic fever or because she has an unfaithful husband. So the man with melancholia may blame the germs of influenza or the drinking habits of a wife who neglects her home and children. If it is scientific to investigate how the way was paved for the rheumatic fever or the influenza, is it unscientific to try to discover why the man was unfaithful and the woman drank? Not a few scientific practitioners consider that toxins and worry are the two prime factors in disease. If this is true, the time has come when it is not fair to tell the hysterical and neurotic there is nothing wrong with them, when they are suffering from a disordered imagination. . . . In many cases it is wise to seek out the roots of the trouble, and the unrecognized cause of the

worry, and how to deal with it. This is the aim of analysis."

In the discussion which followed the opening paper, markedly divergent views were expressed. Pro's and con's alternated with fair consistency, but pro did not always agree with pro, nor did con always agree with con. To one enthusiast, Freud's hypothesis could only be compared in its importance to the hypotheses of Copernicus and Darwin. In offset to this came the plaint of one who had heard the theory discussed *ad nauseam* for many years, with little more than reiteration of the same things and only rarely even a new joke. Much erudition was displayed by the speakers, but seemingly none succeeded in winning over an opponent. And to the reviewer of the discussion it would appear that none who took part in it evidenced any likelihood of being convinced against his will, and so all are of the same opinion still.

W. H. HATTIE

Association Notes

SECOND CONFERENCE ON THE MEDICAL SERVICES IN CANADA

We are pleased to announce that, acting upon many requests from the profession, arrangements have been completed with the Honourable Minister of Health for Canada, to hold the second Conference on the Medical Services in Canada in the House of Commons, Ottawa, on Monday, Tuesday and Wednesday, March 28, 29 and 30, 1927.

Invitations have been extended to various medical bodies throughout the Dominion to send representatives, and it is hoped that they will respond in as splendid a manner as they did to the first Conference held in December, 1924.

An excellent programme is in course of preparation, due consideration being given to many timely subjects of interest to the medical profession and the public.

The Committee in charge desires to take this opportunity of extending a most cordial invitation to all members of the Association to attend the Conference.

It is hoped that a fairly complete report of the proceedings will appear in subsequent issues of the *Journal*.

LISTER MEMORIAL CLUB

SUPPLEMENTARY LIST OF CONTRIBUTORS FROM OCTOBER 1, 1925, TO MAY 1, 1926

We publish below a list of additional subscriptions to the Lister Memorial Club. The fund has now almost reached its objective of $5,000.00.

We have still to hear from the Province of New Brunswick, but the matter is in the hands of the Provincial Association, and we anticipate an early and generous response.

ONTARIO

E. St. George Baldwin, Toronto..	$150.00 (Total $400)	
Stewart Cameron, Peterborough..	10.00	
J. Heurner Mullin, Hamilton.....	10.00	
		$170.00

QUEBEC

H. C. Burgess, Montreal.....	$10.00	
E. M. Eberts, " (additional).....	25.00	
Fraser B. Gurd, Montreal.....	10.00	
C. K. P. Henry, "	10.00	
A. G. McAuley, "	10.00	
Sir Andrew Macphail, Montreal..	10.00	
J. A. Nutter, " ..	10.00	
F. S. Patch, " ..	5.00	
C. L. Roman, Valleyfield.....	10.00	
		$100.00
		$270.00

TOTAL BY PROVINCES

Alberta.....	$ 475.00	
British Columbia.....	300.00	
Manitoba.....	490.00	
New Brunswick.....		
Nova Scotia.....	300.00	
Ontario.....	1,781.00	
Prince Edward Island.....	70.00	
Quebec.....	1,195.00	
Saskatchewan.....	310.00	
		$4,921.00

Medical Education for the World Universal.—While the Rockefeller Foundation is interested primarily in public health problems, this activity is inseparably bound up with medical education in all countries. No matter how well trained the layman may be in routine health work the real success of the enterprise must depend upon medical men. Therefore, the general practitioner must be 'solid' on the idea of disease prevention and must be led to regard himself more and more as a promoter of positive physical and mental well-being for both the individual and the community, the cause of public health and hygiene is doomed to fall short of its larger possibilities.—*Am. Med.*, Dec., 1926.

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Abstracts from Current Literature

MEDICINE

Effect of Encephalitis Lethargica on the Intelligence of Children. Dawson, Shepherd and Conn, J. C. M., *Arch. Dis. Child.*, Dec., 1926, vol. I, No. 6.

A careful analysis of the intelligence of forty-six children who had survived encephalitis lethargica showed that the average was significantly lower than that of normal children of their own age and environment. More than this, on retesting thirty of these children at a later date (seven to thirty-six months later) there was shown a significant deterioration at the second test. This deterioration appeared to be due to to an arrested mental development and was most serious in very young children. Post-encephalitic children with Parkinsonian syndrome or with disturbances of character and emotionality did not show a deterioration in intelligence significantly different from that of the other patients. H. B. CUSHING

Effects of Scarlet Fever on Rheumatic Subjects. Hector, F. J., *Arch. Dis. Child.*, Dec., 1926, vol. I, No. 6.

It is pointed out that almost without exception an attack of scarlet fever in a rheumatic subject is followed by a reappearance of some of the symptoms associated with rheumatic infection. The almost invariable result of scarlet fever upon a heart already damaged by rheumatism is a rekindling of the old trouble, though this may have been quiescent for a considerable period. Further, a mild or moderate attack of scarlet fever is quite capable of bringing this about.

These observations are interesting in view of the more than probable streptococcal origin of the two diseases and the equally probable common port of entry of infection. H. B. CUSHING

The Use of Insulin by Mouth. Miller, H. R., *Arch. of Int. Med.*, December, 1926.

The author first gives a brief summary of the findings of previous workers and comes to the conclusion that none of them have proved the oral administration of insulin to be effective. He points out that though some have obtained a lowering of the blood sugar level, it must be remembered that the diabetic patient was probably being starved during the experiment, and that during starvation, the blood sugar may fall remarkably of its own accord. With this in view, the author's patients received their usual diet the day before insulin was administered by mouth, but fasted after supper, throughout that night, and the next day until the end of the experiment.

The method adopted was to use not more than three minims of insulin in not less than 1 c.c. of alcohol (either absolute or 95 per cent solution) placed in an ordinary gelatin capsule, which was then dipped in keratin solution. Ninety-five per cent alcoholic concentration was used because if less than this strength was taken, osmosis took place through the gelatin capsule wall. This fact, it was thought might explain the failure of other workers to obtain results by the oral administration of insulin.

Under the above precautions, nine non-diabetic patients received insulin by mouth, and no appreciable drop in blood sugar was noted.

Insulin was then given orally by the same method to nine diabetic patients. The blood sugar level in these cases nearly always fell. The decline was greater than could be expected from simple starvation. Most of these patients had first been put through a "control day" to note the effect of starvation alone on the blood sugar level. This procedure usually resulted in a drop of 20 mg., over a period of from four to seven hours. Following the administration of insulin, the average blood sugar drop was 68 mg., over an interval of from two to eight hours.

No Roentgen ray studies were made to determine the fate of the keratin coated capsules in the gastro-intestinal tract. The examination of the stools for their recovery was not satisfactory.

The author admits that his results are not conclusive enough to warrant the administration of insulin orally to diabetics, but reports his work in the hope that carefully controlled experiments may be assembled on a large scale and thus lead to a definite evaluation of any merit this method may possess.

L. C. MONTGOMERY

SURGERY

Observations on the Surgery of the Larger Arteries. Holman, E., *Ann. Surg.*, Feb., 1927, lxxxv, No. 2.

Dr. Holman reports ligature of the innominate artery and subclavian vein, for aneurism following gunshot wound, with recovery of the patient and a good functioning right arm (though somewhat weaker than the left).

Considerable stress is laid on the importance of simultaneous ligation of artery and vein when dealing with injuries of the larger arteries. The literature on the subject is reviewed, calling to mind this too often forgotten (or never known) point of surgical technique. The author intro-

duces one new point, however, claiming that under certain circumstances the vein should be ligated proximal to the point of ligation of the artery.

The methods of treatment of varicose aneurism are reviewed. The dangers of partial (lateral?) ligation of large arteries are pointed out. Division of an artery between ligatures is preferable to ligation even in the aorta.

Coarse ligatures such as flat tapes are recommended for large arteries. The necessity of avoidance of sepsis and of closure without drainage is strongly stressed. L. H. McKim

Post-Operative Treatment of Cancer of the Breast. Carson, H. W., *Brit. Med. Jour.*, Dec. 11, 1926.

Cancer of the breast is now recognized much earlier than in former years. The operation is becoming standardized and, following Sampson Handley's permeation theory, consists of removal of the whole breast, with a minimum of sacrifice of skin, a wide removal of deep fascia, that is, an area ten inches in diameter, centred on the tumour, and including the sheath of the rectus in its upper part, and the pectoralis major and minor, with axillary fat and glands.

Certain factors recognized in the performance of the operation assist convalescence: (1) The removal of only the necessary amount of skin has an important bearing on shock, pain, the healing of the wound and chest complications. (2) The scar should be kept out of the axilla by a properly placed incision. (3) Conservation of blood loss. (4) The application of hot saline towels to raw surfaces not actually being worked on. (5) Delicate quick work without tearing.

Shock is not often seen. It is treated by one pint of saline with 5 per cent glucose per rectum. The patient is placed under an electric cradle in which is one incandescent lamp. This is turned on for half an hour out of every two hours. Pain as a rule is not severe, and chest complications are rare. A few cases of paralysis of the biceps have been recorded. This is due, the author states, to excessive extension of the arm during operation. The patient should be elevated in bed on pillows, the arm being kept at right angles to the body, thereby favouring early return of function. One drainage tube in the axilla is sufficient for drainage. Passive movements of the arm are advised at each dressing, and active motion is commenced at the end of a week. The late swelling seen in the arm and hand, the author thinks is due to pressure on the axillary vein by scar tissue, and is best prevented by early movement. If it does occur and massage fails to relieve, the veins should be exposed and liberated.

All patients should report once a month for the first year, every three months in the second year, and twice in the third year.

R. V. B. Shier

Ischæmic Contracture. Jepson, Paul N., *Ann. of Surg.*, December, 1926.

Ischæmic contracture is a deformity following injury to the extremities, usually of children between the ages of three and twelve. The majority of cases follow injuries at or near the elbow joint. The injured limb is bandaged or splinted perhaps too tightly. There follows swelling, cyanosis, and paræsthesia, followed by pain. Even after removal of the bandages or splint the swelling remains in the muscles, particularly the flexors. The contracture soon follows and involves the wrist and fingers, and finally gives the characteristic claw-hand deformity. Electric irritability is lost after five hours of ischæmia. The muscles then become flaccid and powerless. This is soon followed by rigidity and the painful contracture. This disappears in about seventy hours, leaving the muscles tender and flaccid once more. After a few days the swelling leaves and muscle tissue is replaced by fibrous tissue.

A series of experimental studies was made by Jepson, and in the discussion of his results published at length in the original, he says that direct nerve injury frequently occurs, but it is not proven to be the primary cause. The involvement of the intrinsic hand muscles can be explained only by nerve injury (ulnar), but as a rule injury to some other tissue precedes it. The universal involvement of the flexors may be explained on anatomic grounds. There are, however, several factors involved in the production of this condition. First, there is an injury consisting of a fracture and soft tissue injury. Extravasation of blood and serum follow. Even without splints or bandages the pressure of the exudate may be sufficient to cause cyanosis and myositis and finally pressure on the nerves and blood vessels. Later, due to deficient blood supply, the muscles atrophy. If the intrinsic pressure of the exudate is relieved early, the patient usually recovers readily. These experiments would tend to prove early drainage of value.

R. V. B. Shier

OBSTETRICS

Experimental Studies on the Toxæmias of Pregnancy. Hofbauer, J., *Amer. J. of Obstet. and Gynæc.*, Aug., 1926.

A suggestive analogy is shown between histamine poisoning in animals and premature separation of the human placenta—both conditions show engorgement of the pelvic vessels, uterine spasm, separation of the placenta, and degenerative changes in the liver and kidney.

The probable relationship of accidental hæmorrhage to pre-eclampsia was shown by Dr. J. W. Williams in an earlier paper. Hence the possibility that histamine intoxication is the etiological factor in toxæmias of pregnancy is set forth, although as yet histamine has not been demonstrated chemically in the blood of toxic patients. ELEANOR PERCIVAL

ANÆSTHESIA

Effect of Ether Anæsthesia on Renal Function. Haines, W. H. and Milliken, L. F., *J. Urol.*, 1927, xvii, 147,*et seq.*

The action of ether on the kidneys is to cause vaso-constriction and ischæmia. This is followed by secondary capillary hyperæmia, with the transudation of blood serum and the appearance of albumen in the urine. This action can be prevented by the injection, half an hour before anæsthesia, by the morphine and atropine, which by their action in narcotizing the sympathetic ganglia or the end plates of the renal nerves prevent vaso-constriction in the kidney.

The writers believe that there is no direct toxic effect of ether on the renal cells. When the kidneys, however, are already diseased this secondary hyperæmia might cause very serious aggravation of the existing pathological condition. W. B. HOWELL

Lecture on Anæsthetics. Mackenzie, J. Ross, *Lancet*, January 22, 1927, p. 163.

The lecturer emphasizes the necessity of avoiding starvation and purging, the advantages of the use of sugar and alkalies for several days before the operation. He attributes the satisfactory course of anæsthesia in obstetrical practice to psychic factors. The patient is not afraid of the anæsthetic, but afraid she will not get it. She knows that when she awakes her troubles will be over. The nearest approach to ideal anæsthesia is obtained by the judicious use of nitrous oxide, oxygen, carbon dioxide and ether, followed by de-etherization.

For the successful administration of chloroform three principles are involved: free dilution of the vapour with air; the complete avoiding of intermittency in the administration, and of reflex stimulation during induction.

Ethyl chloride on an open mask is a convenient method of induction before ether anæsthesia. Enucleation of tonsils, circumcision and other minor, as well as some major operations can be done under ethyl chloride alone.

W. B. HOWELL

Anæsthesia in Extrapleural Thoracoplasty for Advanced Pulmonary Tuberculosis. Meyer, Willy, *Arch. of Surg.*, 1927, xiv, pt. 2, p. 432.

A combination of local and regional anæsthesia provides the greatest safety for the patient because there is no interference with the power to cough and expectorate. The writer has abandoned the Kappis paravertebral method on account of its dangers. The Schumacher method is a safer procedure, though occasionally the anæsthesia is incomplete.

Inhalation of ether with oxygen or nitrous oxide with oxygen, a mask being kept tightly on the face, causes aspiration into the lungs of saliva and mucus. When inhalation anæsthesia is necessary, the writer prefers the use of a mixture of chloroform, ether and ethyl chloride in combination with inhalation anæsthesia. The patients are semi-conscious and able to expectorate without experiencing pain. The slow and steady discharge of ether which takes place through the lung produces an artificial hyperæmia which is beneficial. W. B. HOWELL

"Our Debt to Greece and Rome" Series Changes Publishers.—The "Our Debt to Greece and Rome" Series, formerly published by the Marshall Jones Company, has been taken over by Longmans, Green & Co. Six new volumes are announced for early publication: "Modern Traits in Old Greek Life," by Charles Burton Gulick, Professor of Greek at Harvard University; "Martial," by Paul Nixon, Dean of Bowdoin College; "Stage Antiquities," by James T. Allen, Professor of Greek, University of California; "Greek and Roman Folklore," by W. R. Halliday, University of Liverpool; "Aeschylus and Sophocles," by J. T. Sheppard, King's College, Cambridge; and "Apuleius and His Influence," by Elizabeth H. Haight, Professor of Latin at Vassar College.

On Cellulose Sausage Casings.—We learn from a bulletin sent out by the United States Department of Agriculture, that a survey of the present sausage-casing industry has revealed the need of a synthetic substitute for the animal casings now in use. Such a substitute has been found in cellulose of a high grade character, and machinery has been developed for the manufacture of thin walled, seamless, cellulose tubes, mechanically and chemically suitable for use as sausage casings. Such casings are clean and satisfactory from every hygienic and sanitary standpoint, and are not subject to putrefaction. They can be made in any desired size and the stuffing of them can be accomplished more readily than with animal casings.

Obituaries

John Alexander Mitchell, born in Haldimand County, Ontario, on April 14, 1864, passed peacefully away on January 17, 1927. He received his education in the public school of his native village and in Caledonia High School, and graduated in medicine from Trinity Medical College in 1892. Shortly after graduation he settled in Drumbo where the rest of his life was spent. In 1894 he married Miss Elizabeth Scott of Hamilton, who predeceased him in 1916.

Dr. Mitchell was for years a member of the local public and continuation school boards and a police trustee. He was medical officer of health for the townships of Blenheim and Blandford and local surgeon for the Canadian Pacific Railway. He was a regular attendant of all meetings of Oxford County Medical Society, and was never known to miss a district or annual meeting of the Ontario Medical Association. He will long be remembered by the people of Blenheim Township, among whom he toiled, for he never spared himself if his patients needed him and wore himself out at an early age trying to serve them.

The writer has been his neighbour and a close friend for over twenty years and can testify to Dr. Mitchell's fine type of manhood. He was never known to say or do anything to injure another physician. A few days after attending our district meeting in Goderich last September, a cardio-vascular condition developed which forced him to give up his work.

By his death the whole community as well as all his fellow practitioners in this district have lost a good friend. Five daughters and one son survive him.

W. WOOLNER

Dr. James Russell McRae of Winnipeg, died on February 7th of pneumonia after an illness of six days at the age of fifty-nine years. He graduated M.D., C.M. from Manitoba Medical College in 1896 and practised in Neepawa with Dr. J. S. Poole until 1907 when he removed to Winnipeg. He is survived by his widow and two sons. Of a quiet and retiring disposition Dr. McRae was most loved and respected by those who knew him best and the welfare of his patients was his first concern. Indeed in his last illness and with an elevated temperature he went out to see a patient on whom he had recently operated.

Sir Isambard Owen. We regret to notice the sudden death in Paris on January 14th of Sir Isambard Owen, always an enthusiastic supporter of the British Medical Association. A graduate of Cambridge and of the medical school of St. George's Hospital, he early took a prominent place in the medical life of London in connection with that hospital, and later on became its dean occupying the chair of lecturer on medicine until his appointment to be principal of Armstrong College, Newcastle-on-Tyne. Of Welsh descent, he took a lively interest in the establishment of the University of Wales. While a young man he was an active member of the London Welsh Society of Cymmrodorion and in 1879 became a member of its council. In 1891 he was one of the representatives of Cardiff at a university conference appointed by the Welsh universities. In 1893 he was elected senior deputy chancellor of the University of Wales, and after the death of Lord Aberdare he became virtually the acting head of the university. In 1902 he received the honour of knighthood in recognition of the work he had accomplished for Wales in promoting the establishment of the national university. Isambard Owen was a good friend and a charming companion. His manner was always conciliatory, but his criticisms at meetings were often of a keen, trenchant character. He always took a lively interest in the affairs of the British Medical Association and was chosen as its president at the annual meeting at Swansea.

News Items

GREAT BRITAIN

LISTER CENTENARY CELEBRATION

BRITISH MEDICAL ASSOCIATION ANNUAL MEETING
JULY, 1927

A public meeting in celebration of Lord Lister's Centenary is to be held in the McEwan Hall, Edinburgh, at 8 p.m. of Wednesday, 20th july. The Rt. Hon. Earl Balfour, K.G., O.M., has consented to take the chair, and short addresses will be delivered by Sir William Watson Cheyne of London, Professor Tuffier of Paris, Professor Harvey Cushing of Harvard University, and Dr. James Stewart of Halifax, Nova Scotia.

Throughout the week of the association meeting a museum of Lister relics will be on view in the Upper Library of the Old University. In this connection most generous assistance has been given by the Directors of the Wellcome Historical Museum, Wigmore Street, London, and the unique interest of the exhibits will largely be due to their co-operation and liberality.

A Lister Memorial Volume has been prepared, and with the consent of the Council of the British Medical Association it will constitute the Book of the Meeting in so far as a copy will be presented to each registering member of the association. The volume, edited by Dr. Logan Turner, contains a variety of contributions. A sketch of Lord Lister's life is given by his former house surgeon, Sir George Beatson of Glasgow. A series of short personal reminiscences has been written by Sir William Watson Cheyne, Dr. Rutherford Morrison, Dr. Grasett, Dr. Baldwin, Dr. T. R. Ronaldson, the late Professor Francis Caird, Dr. Stewart (Halifax), Dr. Douglas (Cupar), and Mr. Hamilton Russell (Melbourne).

Two of Lister's scientific addresses, and a series of letters of general interest are incorporated in the book. A number of striking comments which he made at various times in relation to the germ theory and the antiseptic system, and in fact upon things in general, have been grouped in a chapter under the heading "Obiter dicta".

A section of particular interest is that dealing with the lives of Lister's fellow residents in the Edinburgh Royal Infirmary during the summer of 1854, a group which included Beddoe, Christison, and Kirk—

men who won distinction in widely differing fields. This chapter has been contributed by Dr. Logan Turner.

A chapter entitled "Surgery prior to Lister's time" is written by Mr. Alexander Miles, while the influence of Lister's work on surgery is contributed by Professor Fraser; Professor Schafer deals with Lister's work as a physiologist.

The volume is illustrated, and, except in so far as the reproduction of certain letters and published articles is concerned, the matter is original. The volume consists of from 180 to 200 pages in quarto size.

The residences which Lister occupied while in Edinburgh have hitherto been undistinguished by any memorial inscription. The committee considered the present a suitable opportunity to remedy what may have seemed to many an omission. With the generous consent of the proprietors concerned, short indicatory inscriptions are being placed upon the wall of 11 Rutland Street and 9 Charlotte Square.

A donation of £25 was received by the committee, the donor desiring that this sum should be awarded as a prize for the best essay submitted on the subject "The Influence of Lister on Surgery." To the original prize the committee have added a gold medal, and this award is open to students and graduates of not more than one year's standing of any medical school in the British Empire. The terms upon which the essays are to be submitted have already appeared in the medical press, and notices have been sent to the various teaching centres.

It is intended that the award of the prize and medal shall be made by Lord Balfour at the Lister Centenary Meeting on July 20, 1927.

THE ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH

A quarterly meeting of the college was held February 1st, Dr. G. M. Robertson, President, in the chair. Dr. James Richan Drever and Dr. Alan Leonard Smith Tuke, M.C., were introduced and took their seats as fellows of the college. William Bell, M.D. Edin., was elected a fellow of the college. Robert Finlay Aitken, M.B., N.Z., Sittampalam Thiagarajah, L.R.C.P., Edin., Alexander Murray Affleck, M.B. Edin., James Kirkwood Slater, M.B. Edin., and Prag Nath Kapur, M.R.C.S., Eng., L.R.C.P. Lon., were elected members of the college.

GENERAL

THE BERMUDA BIOLOGICAL STATION FOR RESEARCH, INC.

In August, 1925, twelve men interested in the Bermuda Biological Station for Research met at Woods Hole to consider the future of the station.

The unanimous expression of the meeting was to the effect that a rich semi-tropical fauna and flora such as exist in Bermuda offer ideal opportunities for biological research and that Bermuda's advantages as a location for a biological research station are conspicuous. In Bermuda, reached from New York in about forty-eight hours, this semi-tropical life is accessible to biologists of a large portion of the United States and Canada at a minimum expense of time and money. Living conditions on the island afford reasonable convenience and comfort and freedom from exposure to the dangers which accompany living in a less civilized tropical region. The climate is as nearly as possible ideal. Even in mid-summer, biological work may be pursued either in the field or in the laboratory without serious discomfort.

The station, while never operated on a large scale, may nevertheless fairly be said to be strongly established. It has been in operation for nearly a quarter of a century. In the course of that time about two hundred and fifty persons have carried on investigations at the station.

The outcome of the Woods Hole meeting of 1925 was a plan for the complete re-organization of the station. It was proposed to follow, in a general way, the scheme of administration which has proved so successful in the case of the Marine Biological Laboratory at Woods Hole.

As a step toward this organization, a list was prepared including about one hundred and seventy-five persons, residents of Great Britain, Canada and the United States, who, because of having done biological work at the present station or for other reasons, might be expected to be interested in the development of the station. To all these persons were sent letters requesting co-operation, and asking nomination of five persons to serve as a committee on re-organization. One hundred and thirty-four persons signified their willingness to join the corporation, and the following Committee on Re-organization was elected: C. L. Bristol, E. G. Conklin (chairman), E. V. Cowdry (secretary), E. L. Mark, H. W. Rand. The responses were, in general, most encouraging and fifteen prominent Bermudians accepted membership in the corporation. During the past winter, Dr. A. G. Huntsman, of the Biological Board of Canada, with two American biologists visited the island and the station.

Pending the completion of the legal processes of incorporation, further steps were taken to secure the co-operation of the Bermudian government and residents, and also to elicit the approval and support of the Royal Society, the Biological Board of Canada and the National Research Council of America as well as the Rockefeller Institute. It it proposed that provision be made for a resident director and that the station be open to investigators throughout the entire year.

Professor F. R. Miller, of Western University, London, Ontario, lectured on the "Function of the cerebellum," on January 4th, before the University of Buffalo Medical School and members of the Buffalo Academy of Medicine.

The Hunterian Lecture was delivered before the Hunterian Society of London on January 17th, by Dr. J. M. T. Finnie, Professor of Surgery to Johns Hopkins University, who chose as his subject "The influence of John Hunter on American surgery."

An effort is being made to obtain $20,000 to endow a fellowship at John Hopkins University to be known as the Brooks Research Fund and to be administered by the Faculties in Zoology and Botany for the benefit of exceptional young men who may be laying the foundations for research careers in those subjects.

A bill to prohibit the teaching of every theory of evolution that denies the divine creation of man was introduced into the Alabama house of representatives on January 12th by the Rev. C. O. Thompson of Etowah.

George Eastman, founder and president of the Eastman Kodak Company, has been awarded the Progress Medal of the Royal Photographic Society of Great

Britain in recognition of Mr. Eastman's inventions, researches and publications, resulting in an important advance in the development of photography.

The University of Pennsylvania has received a contribution of $250,000 from the Carnegie Corporation for the endowment of medical research in the university school of medicine.

Colonel Henry W. Sackett of New York City has given $200,000 to Cornell University to provide for the permanent conservation of the landscape beauty of the university campus.

Contracts have been let for the construction of the Service Memorial Institute, a unit in the group of buildings devoted to medical instruction at the University of Wisconsin. It will provide quarters for research and clinical work in various departments of the medical school.

The Chicago Lying-in Hospital has announced plans for its affiliation with the University of Chicago. A new million dollar building will be erected on the university campus.

On January 8th, Professor W. L. Holman, of the department of bacteriology at the University of Toronto, delivered an address to the Royal Canadian Institute on the subject "The microbe and civilization." On January 15th, A. G. Mörzer-Bruyns, formerly agricultural expert for the Dutch government, at the Hague, gave an address on "Canada—Holland, agriculture and immigration."

Brigadier-General Charles H. Mitchell, dean of the faculty of applied science and engineering of the University of Toronto, has been elected president of the board of trade of the city of Toronto.

The Chicago Medical Society held a memorial meeting in commemoration of the late Dr. Albert J. Ochsner on February 3rd. Dr. Walter W. Chipman, Montreal, Canada, spoke on "A personal appreciation of Ochsner"; Dr. William J. Mayo, Rochester, Minn., on "Ochsner's work," and Dr. Allen B. Kanavel, Chicago, on "Surgical progress." This is the first lecture of the Ochsner Memorial lectures established by the northside branch of the society.

Dr. Francis E. Lloyd, professor of botany at McGill University and president of the American Society of Plant Physiologists, lectured on Spirogyra before the Science Club of St. Lawrence University on January 20th. The lecture was illustrated with his original lantern slides and moving pictures.

In the new year honours list of the King of England are included the following scientific men and others connected with scientific work: Privy Councillor: The Honourable W. G. A. Ormsby-Gore, under-secretary of state for the colonies and president of section E (geography) of the British Association at the Oxford meeting in 1926. Knights: Dr. Henry Head, who has made distinguished contributions to our knowledge of the nervous system; Mr. A. E. Kitson, director of the Geological Survey, Gold Coast Colony; Dr. D. Milne Watson, governor of the Gas Light and Coke Company, London. K.C.B. (civil division): Dr. G. Macdonald, secretary to the Scottish Education Department. C.B. (civil division): Mr. H. T. Tizard, principal assistant secretary, Department of Scientific and Industrial Research. C.I.E.: Lieutenant-Colonel J. W. Cornwall, lately director, Southern India Pasteur Institute, Coonoor, India; Mr. D. Anstead, director of agriculture, Madras; Mr. D. Milne, director of agriculture, Punjab. K.C.M.G.: Professor W. Mitchell, vice-chancellor of the University of Adelaide, in recognition of his services to the Commonwealth of Australia.

By the will of the late Colonel George R. Hooper, of Montreal, McGill University will receive $100,000.

NOVA SCOTIA

Dr. A. M. Marshall has been appointed anæsthetist to the Children's Hospital, Halifax.

Dr. Charles Spiro, after post-graduate work in New York and Vienna, has located at New Glasgow. He will specialize in eye, ear, nose and throat work.

Dr. George H. Murphy was the special speaker at the exercises, held January 26th, which marked the graduating of five nurses from the training school of the Halifax Infirmary.

Dr. John Stewart, dean of medicine, Dalhousie University, has recently returned from a greatly enjoyed trip which took him to British Honduras and several West Indian ports.

Dr. L. B. W. Braine, of Annapolis Royal, is making a somewhat extended visit to several of the medical centres of the United States.

At the annual meeting of the Nova Scotia Conservative Association, held on February 4th, Dr. H. K. MacDonald, of Halifax, was again elected to the presidency.

The January meeting of the Osler Medical History Club was held at the residence of Dr. Alan Curry. Dr. Curry contributed a very interesting biographical sketch of Hugh Owen Thomas, referring in particular to his careful study of cases requiring the application of splints and to his ingenuity in devising splints.

The annual meeting of the Nova Scotia Division of the Canadian Red Cross Society was held at Halifax on February 2nd. Reports dealing with home nursing classes, Junior Red Cross, port work, hospital visitations and other interests all showed that the society continues to function actively. Among local speakers, Dr. A. C. Jost, provincial health officer referred in commendatory terms to the public health work of the Red Cross. The principal speaker was Col. J. L. Biggar, chief commissioner of the Canadian Red Cross Society, who congratulated the provincial organization on the work accomplished, reviewed the post war activities of the national society, and discussed plans for the future. J. L. Hetherington, who has been the energetic president of the Nova Scotia Red Cross for several years declined to consider re-nomination, and W. H. Hayes was elected to succeed him.

At the recent annual meeting of the Victorian Order of Nurses, Halifax District, the reports of Mrs. William Dennis, the President, and Miss Campbell, the District

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Superintendent, showed that the year had been one of great activity, and demonstrated anew the invaluable services of the order to any community in which it is established. Under the tactful guidance of Mrs. Dennis, who has been president of the Halifax branch since its inception, the Victorian Order has made steady headway and has gained the confidence and goodwill of all classes. Quite naturally the medical profession has special opportunity of witnessing and evaluating the work of the nurses, and Dr. F. R. Little gave voice to the profession's appreciation and commendation of that work. Mrs. Dennis had stated that a motor car would be of much service, and Dr. Little expressed the same opinion, whereupon His Honour, Lieutenant-Governor Tory announced that he would present a car for the use of the nurses. Mrs. Dennis was re-elected to the presidency, and Miss Campbell continues as district superintendent.

W. H. HATTIE

NEW BRUNSWICK

On Wednesday, January 26th, the Saint John Dental Society were hosts to the Saint John Medical Society at a banquet in the Hotel Admiral Beatty, Saint John, N.B. Seventy-five members of a combined society were present. Dr. G. A. B. Addy read a paper on "Infections of the mouth," the discussion of which was led by Dr. James M. Magee. Dr. W. P. Broderick, representing the Dental Society, spoke on "Points of contact between the dental and medical practitioner." Discussion of this paper was opened by Dr. W. E. Rowley and provided grounds for considerable controversy. Points of special interest brought up during the meeting included, the extraction of acutely abscessed teeth and the relationship of abscessed teeth to general infection. A vote of thanks to the dental profession was emphasized by Dr. W. F. Roberts and Dr. A. S. Kirkland.

The writer hopes that this will be only the first of several such combined meetings.

Word was received lately of the marriage of Dr. Anna St. Clair Creighton to James Roy Laing in New York. Dr. Creighton is a graduate of Dalhousie University and was an interne at the St. John General Public Hospital. She is at present completing an interneship at Bellevue Hospital.

Dr. Margaret Parks of Saint John has done much this winter by her enthusiasm and skill, to popularize curling among the ladies of Southern New Brunswick.

It is reported that Dr. H. Cyr who has practised for some time at Buctouche, has removed to St. Basil.

The latest reports from Shediac state that Dr. M. A. Oulton, M.L.A., is slowly recovering from a serious attack of lumbago and sciatica. His friends hope for his rapid recovery thus enabling him to resume his practice and to appear at the forthcoming session of the provincial parliament.

Sporadically for the last two or three years, the question of consultation between registered practitioners and representatives of various irregular cults has been up for discussion. In several cases this question has been decided by the members of local county societies and their decision has always been, that an ethical practitioner should have nothing to do with irregulars. Interest in a recent case has been sufficient to rekindle the old arguments. It is felt that the code of ethics as dictated by the Canadian Medical Association covers the action of members in such cases. It is to be sincerely hoped that all will keep their skirts clean of any such indiscretion.

Dr. G. A. B. Addy has been re-elected president of the health centre at Saint John.

Col. Biggar, head of the Canadian Red Cross, during his recent visit to New Brunswick, commented very favourably on several things which were brought to his attention. Among these were the efficiency of the health centre at Saint John, which is now an integral part of the civic life. Another point which Col. Biggar thought well of was the Red Cross Outpost Hospital established at St. Leonards.

Dr. Mabel Hannington of the Department of Public Health, Saint John, addressed the Nova Scotia Council of Mental Hygiene in Halifax, on the question of "The mentally deficient child." Dr. Hannington's wide experience in this line especially fits her to speak authoritatively on the subject.

On February 15th, Dr. W. E. Rowley appeared before the Fredericton Medical Society and spoke on the subject of "Rheumatic fever," discussing the question from the standpoint of its effect on the child as contrasted with its effect on the adult. This is the first of a series of such lectures which have been planned by the Fredericton Medical Society. In each case it is intended to have an outside speaker introduce the subject which will be discussed by specially appointed local speakers.

For some years there has been increasing difficulty experienced by the New Brunswick Council of Physicians and Surgeons regarding the registration of physicians in the province by reciprocity with the British Medical Association. It has now been decided that only by two methods may a candidate be licensed to practise medicine in New Brunswick. First: by passing the examination set by the Council of New Brunswick, or second: by passing the examination of the Dominion Medical Council. It is expected that this will obviate many of the difficulties experienced in the past.

The death of Mr. J. King Kelley, K.C., on February 15th, has removed from the commission of the General Public Hospital, one of its most devoted members. Mr. Kelley's interest in hospitals extended beyond his local associations, and any movement to improve the position of the indigent sick person, always received his fullest support. In this connection, the Saint John County Hospital for Tuberculosis, received from Mr. Kelley, a great deal of assistance from the time of its foundation.

The number of hospital beds in New Brunswick, although greatly increased in the last four or five years, is still below the actual need of the population. This has been forcibly drawn to our attention during the winter by reports from Moncton that their hospital has had the largest number of patients per diem in its history and has been forced to maintain a waiting list. The same is true in Saint John, where accommodation has been increasingly over-taxed since early in the spring of 1926. It is to be hoped that, with the possibility of better times in the Maritime Provinces money will be available considerably to increase our hospital buildings and equipment.

A. STANLEY KIRKLAND

QUEBEC

The Medico-Dental Building

It is a significant sign of the times that, so soon after the completion of the Medical Arts Building on Sherbrooke Street in Montreal, a second office building should have been planned for the exclusive use of the medical and dental professions.

The structure is to be known as the Medico-Dental Building and is being erected by Messrs. Anglin Norcross Limited, contractors, at the corner of St. Catherine and Bishop Streets, for May 1st occupancy. It is to be fire proof and will occupy a large area with windows on all sides and a light-well in the centre. The architects, Messrs. Ross and MacDonald, state that the offices are to be fitted with all the up-to-date requirements of the two professions, including gas, compressed air, electric connections for light, power and x-ray, continuous hot water, special drainage pipes, large windows, etc. A central telephone exchange is to be maintained, the operators accepting, replying to, and forwarding messages as directed, at all hours of the day and night.

Buildings of this nature have become almost universal in the United States, the object being to obtain the highest degree of efficiency with the minimum of effort. The principle of segregation is not new, for medical men have for generations patronized certain streets or districts in all large cities. The medical office building is simply an extension of the idea, with the added advantages that result from co-operation, for, by thus grouping doctors and dentists together in a single building, the builder is enabled to supply free of cost all the latest mechanical devices and personal comforts, which, if installed in a private dwelling or individual office, would call for a heavy outlay of money. There is, moreover, a growing desire upon the part of the families of professional men to be relieved of the constant inroad of strangers into their homes, while the high pressure at which most professional men are working to-day makes it necessary for them to confine themselves to certain prescribed office hours; a difficult matter when practising from their homes. Considering all these things medical office buildings would seem to be a step in the march of modern progress.

Quebec

Professor Rousseau, dean of the medical faculty of Laval has been appointed during his last trip in France corresponding member of the "Academie de Médecine" in Paris. Professor Rousseau is the first Canadian physician to be awarded this special distinction. On his return from Paris, Doctor Rousseau was the guest of honour at a dinner given by his colleagues of the medical faculty and the medical profession of Quebec together with many civic, political and university authorities.

Professor N. A. Dussault of Laval and Dr. J. Vaillancourt, professor "agrégé," were appointed members of the "Societe de Laryngologie des Hôpitaux de Paris."

During the last few weeks the Quebec Child's Welfare Association, pursuing its active campaign against infantile mortality arranged for the delivery of six lectures in the dispensaries of the "Goutte de Lait" in the different parts of the city by Dr. Couillard, professor of hygiene and district inspector. These lectures were attended by great numbers of mothers.

A. Vallée

Colonel R. St. J. Macdonald, associate professor of preventive medicine at McGill University, has been created a Fellow of the Royal Sanitary Institute, England, in recognition of his sanitary work done both at McGill University and during his military service. Colonel Macdonald is a graduate of McGill University, and served in France for four years during the war in different units; he went overseas as a captain with the McGill unit, and when it was demobilized at the close of the year, he was given the rank of a full colonel. While overseas he wrote a book on military sanitation, entitled *Field Sanitation*, which has been adopted as the official publication of the Canadian Army Medical Corps.

The death occurred recently of James Peters Hanington, M.D., C.M., D.Ph. He was eighty-one years of age and was a native of Shediac, N.B. The deceased was a prominent graduate of McGill University; a member of the class of 1894. He acted as the examining physician of the Canadian Pacific Railway passenger department for seventeen years, and was also well-known for his general activities.

McGill University will hereafter associate itself prominently with the public health movement. A communication from the Board of Governors received by corporation of the university stating that "the governors are convinced that the time has come when the Department of Hygiene should be enlarged and its course of lectures should include sound instruction in all public health movements. It was also considered desirable that the department should participate in an advisory capacity in all the important health movements of the community." As a step towards the consummation of this project, the governors reported that Dr. A. Grant Fleming had been appointed acting director for one year. The plan met with the approval of the corporation.

The incorporation of the Brehmer Rest Preventorium under a charter from the provincial government was secured during the past year. The installation of an alpine lamp has considerably increased the effectiveness of its equipment and the reduction in the price charged each patient will make it possible to secure more patients. During the past year, 242 weeks' care were given free at the expense of the Rest. In the absence of the medical superintendent, Dr. Phelps, Dr. Roddick Byers read the medical report. Of the forty-four patients who passed through the institution during the year, thirty-eight showed great improvement. The report attributed this excellent result to a careful selection of applicants and to systematic treatment. Patients spend twenty hours in the open air every day, winter and summer. Dr. Byers in his address emphasized the preventive aspect of the Rest, stating that its mission lay in building up tired bodies rather than in curing those definitely tuberculous. "Patients taken early enough can be sent back to a self-supporting position in one quarter of the time and at one half the cost of treatment of those who are allowed to develop a condition requiring sanatorium treatment." The proximity of the sanatorium at Ste. Agathe makes it unnecessary for the Rest to take any but preventive cases.

The wing in course of construction at Bordeaux Jail for the internment and treatment of such prisoners as are declared insane by the courts, was ready for partial occupancy February 15th. The staff will be under the direction of Dr. Daniel Plouff. The criminal insane are being now transferred from St. Jean de Dieu Hospital, the Verdun Protestant Hospital, and the St. Michel Hospital of Beauport, Quebec. It is estimated that about 300 persons will thus be transferred to the Bordeaux Hospital which, at the outset, will have a capacity of 400 beds. The transfer has been made in

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groups of ten patients at a time, in order to allow Dr. Plouff and his assistants to study each case as it comes under their attention.

While this wing will be primarily devoted to the treatment of insane criminals, it is probable that patients from other hospitals who have to be kept in absolute security will also be transferred there.

GEORGE HALL

ONTARIO

The new Nickle maternity pavilion at the Kingston General Hospital was opened for the reception of patients early last month.

The plans for extensive enlargement of the Toronto General Hospital were announced by the board of governors early in February. As a result of these plans the hospital accommodation will be increased by nearly two hundred beds. A new nurses' home, a new pavilion for private patients, a new building for pathology, are amongst the additions. The out-patient department is to be moved and greatly enlarged and a new and extensive housing arrangement for the enormous service of radiology is to be provided. The new buildings will necessitate the closing of the objectionable street immediately behind the hospital and by their extension will remove much of the unsightliness of the old "ward" which at present causes comment by patients in the private wards who have to look out on it. The expense of the projected improvements will be borne by the city and the province.

The meeting of the Toronto city council at which was announced the scheme for the enlargement of the General Hospital took into consideration also the needs of the Western Hospital which has been showing a phenomenal growth in the numbers of patients admitted for treatment; it was suggested that if the united Grace–Western institution could raise a substantial sum that the city would grant a generous amount for the necessary improvements and enlargements.

The Harvey Club of London met on December 21st, and was addressed by Dr. E. Spence who took as his subject "Diabetic acidosis with comments on its treatment."

The monthly meeting of the Wellesley Hospital took place on January 13th. The following interesting programme was provided: "Landry's paralysis," Dr. J. E. Elliott. "Multiple myelomata with Bence-Jones proteinuria," Dr. McMillan. "An unusually diffuse eruption of shingles with remarks on treatment," Dr. Allan Adams. There was a good attendance and free discussion; a full report of the presentations will appear at a later date.

The January meeting of the out-patient staff of the Toronto General Hospital took place at the university club where after a dinner the members of the staff were addressed by Professor Duncan Graham on the many and interesting phases of the anæmias.

Dr. C. W. Harris, son of Dr. Harris, chief surgeon at Grace Hospital, was a successful candidate at the examination for the degree of F.R.C.S. London.

Dr. F. C. Noble, son of Dr. Robert Noble of Toronto, has acquired the degree of F.R.C.P. London, at the recent examinations.

An outpost hospital was opened at Bancroft, North Hastings, on January 20th, the result largely of an appeal to the medical profession made by Dr. Farley at a meeting of the Ontario Medical Association some five years ago; the active assistance of the Red Cross, Dr. F. W. Routley, Dr. T. C. Routley and Dr. Forbes Godfrey, together with the activities of local organizations under Mr. W. E. Wiggins, Mrs. J. Collings and Miss E. H. Jones made possible the acquiring a sum of $9,000 with which the work was begun. At its opening Dr. Farley, a past-president of the Ontario Medical Association, made the following address:

About five years ago the Ontario Medical Association decided to appoint a committee to make a medical and a hospital survey of the Province of Ontario, in order to find out the location of the medical men and the hospitals, and how they have ministered to the wants of the various municipalities throughout the province.

The committee had not been at work very long when some astounding facts were quickly brought to light. In many localities more medical men were located than was considered necessary to attend to the professional needs of the community, while in other places, where formerly there had been a doctor, none was available. In many places we found proper hospital facilities; in some two hospitals where one would be ample; whereas in other communities, often where most needed, none at all. These facts were reported at the next meeting of our association and the committee was instructed to "carry on" and to endeavour to find some solution for the apparent irregularities and service.

After a thorough canvass of the province, the committee found several communities in Old Ontario to be in a worse condition, from a medical point of view than many districts in New Ontario, where, owing to the co-operation of the provincial government and the Red Cross Association the medical requirements of the latter were being well and efficiently met. In Old Ontario nothing was being done to meet these conditions. It was pointed out by the committee to the Ontario Medical Association that the people in North Hastings were, as regards medical aid, in a worse plight than any other community in the province.

Here was a district, thirty miles one way by fifty miles another, with only two doctors, having a population of over 6,000 people, pocketed in different localities and connected only by poor or indifferent roads. It was absolutely impossible for two medical men to cover the ground adequately. Something had to be done. This condition was reported to the Ontario Medical Association and the committee was asked to continue its investigations and was given permission to approach the provincial government and explain the situation.

Following these instructions the committee waited on the Minister of Health, the Hon. Dr. Forbes Godfrey. He consented to grant us ten minutes but was kind enough to give us a hearing of one hour and fifteen minutes and was so convinced of the needs of the people in these districts that he ordered the Provincial Board of Health to continue our investigations and to report to us as well as to himself. This report was received and from it much additional information was gained. It showed an infant mortality of astounding proportions, in exact ratio to the facilities for medical attention.

The government was approached to assist in founding two types of institutions; first, hospital centres where patients could be brought in for medical attention, second, nursing out-post stations where a health nurse

would have headquarters, and could go about amongst the people, giving advice and rendering first aid. But all our arguments were in vain. In grim despair we reported back to the Ontario Medical Association, which body, undaunted, told us to *go on* and *fight it out*. But what could we do? As the provincial government would grant no financial aid, we turned utterly discouraged to the Red Cross Association, the greatest friend of suffering mankind since the time of Florence Nightingale.

An appointment was made with their medical director, Dr. Routley, and no sooner was a request for aid received from Bancroft than Miss Wilkinson, the able and efficient representative of the Red Cross Society was on her way to your village.

It was decided to found a hospital with the assistance of your county council and the energetic, wholehearted devotion of your president, secretary and the members of your society. As a result of the combined activities of the Ontario Medical Association and its hospital committee; the advice and co-operation of the Minister of Health, the generosity of the county council, together with the untiring efforts of your local Red Cross Association, backed up by the faith and financial support of the citizens of North Hastings, you now have in your midst a Red Cross Hospital of which we are, all, justly proud.

A gathering of unusual significance held recently (and quietly) demonstrated something of the degree of esteem and affection which may be shown to that retiring and reserved type of efficiency so rare in these days of journalistic intrusions. At a banquet tendered by his co-workers at Grace Hospital, Dr. W. H. Harris, chief surgeon and dean of the staff, was presented with his portrait painted by Wyly Grier and was compelled to listen to a score of addresses informing him that while he had been labouring "without haste, without rest," as the old German saying goes, he had been acquiring a reputation for skill, for kindliness, and for honesty of purpose, which had endeared him to all, and which had gone far towards the making of Grace Hospital an institution in which good fellowship and good work went hand in hand. A sketch of Dr. Harris' activities, his many interests and the personal side of his kindly career was skilfully drawn by Dr. J. H. McConnell after which the portrait was unveiled: the presentation made by Dr. W. A. Burr was heartily applauded and the remarks made by Dr. Harris in accepting the portrait so affectionately given, left no doubt in the minds of his hearers as to his appreciation of their tribute.

On November 25th, a joint meeting of medical men and dentists was held in Brantford. An excellent meeting was reported; there being an attendance of sixty. Dr. Fulton Risdon of Toronto gave an address on "Benign and malignant tumours of the jaw."

Dr. A. T. Bazin of Montreal addressed the Sault Ste. Marie Medical Society on January 7th, his subject being "Surgical dyspepsia."

On January 13th, the North Bay Medical Society was addressed by Dr. Geo. Wilson of Toronto, on the subject, "The treatment of fractures."

The Lincoln County Medical Society met at St. Catharines on January 20th, Dr. Roscoe Graham of Toronto gave a talk on "A tour of European surgical clinics."

At a meeting of the North Waterloo Medical Society held at Waterloo on January 28th, Dr. M. H. V. Cameron of Toronto spoke on "Wounds and their infections."

On January 27th, Dr. W. Easson Brown of Toronto, addressed the South Waterloo Medical Society at Galt, his subject being "Anæsthesia."

Dr. H. J. Shields of Toronto also gave an address on the same subject before the Peterborough Medical Society.

Dr. W. P. Tew of the Western University Medical School, London, addressed the Essex County Medical Society on February 1st, his subject being "The toxæmias of pregnancy."

At a meeting of the Niagara Falls Medical Society held on February 9th, Dr. H. E. Paul of Toronto spoke on "Disturbances of urination in diagnosis of urinary conditions."

Dr. H. A. Dixon of Toronto addressed the Lambton County Medical Society at Sarnia on February 9th, his subject being "Common skin affections, their diagnosis and treatment," with lantern slide illustrations.

The Muskoka Medical Society met at the Muskoka Hospital for Consumptives on Wednesday, February 9th, when Dr. F. W. Hughes of London gave an address on "Recent advances in infectious diseases." This was followed by a pathological address by Dr. Wm. Magner of Toronto.

On February 9th, at the regular monthly meeting of the Peterborough Medical Society, Dr. R. I. Harris of Toronto gave a talk on "Orthopædic surgery as it applies to cases in general practice."

The February meeting of the York County Medical Society was held at the Hospital for Sick Children, Toronto, on Friday, February 11th. Dr. W. E. Gallie and Dr. D. E. Robertson of the surgical staff assisted by their associates gave a clinic and discussed various surgical conditions that are frequently encountered among children in hospital and private practice. A goodly number of the rural members of the society were present and all enjoyed a very profitable clinic and discussion.

S. W. Otton

On January 4, 1927, the Academy of Medicine held a Library and Historical Night, which was well attended by the Fellows.

Presentations were made as follows: "Canon Medicinæ of Avicenna, 1608," the gift of Dr. H. A. Beatty, presented by Dr. P. M. O'Sullivan. An original Semmelweiss Antiseptic Midwifery Basin, presented by Dr. W. R. Patterson. A work of Dr. J. H. Garnier, an Ontario Naturalist Physician, was presented by Dr. A. J. Mackenzie.

Professor G. S. Brett, of the University of Toronto, then addressed the Fellows on "Gall, and the state of the medical profession at the end of the eighteenth century." Dr. J. W. Crane, of the University of Western Ontario, London, then gave an address on "An autobiography of a country physician, Dr. Hugh Ross of Clifford." At the close of the programme, refreshments were served in the Journal Room where an exhibit of books and prints was on view.

On January 31st, Dr. James T. Gwathmey, of New York, addressed the stated meeting of the academy on the subject of "Preliminary medication, with special reference to general anæsthesia and obstetrical analgesia." Preceding the meeting, a dinner was held in the academy building, at which Dr. Gwathmey was the guest of honour.

The many friends of Dr. P. A. Dewar, both in the Border Cities and in Detroit, tendered him a banquet at the Beech Grove Country Club last December. There was a long programme of addresses, all of them very

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complimentary, in which Dr. Dewar was said to epitomize the best ideals in the medical profession and in citizenship. The banquet was in every way a very brilliant affair.

On January 27th, a reception for the graduating students in medicine of the University of Toronto was given by the Academy of Medicine, Toronto. The facilities for post-graduate work in different medical centres of the world, including London, Frankfurt, Copenhagen, University of Lund, Southern Sweden, Stockholm, Louvain, Pasteur Institute, and Vienna, were briefly outlined by the following: Drs. G. H. Agnew, C. H. Best, W. R. Patterson and Gordon Murray. Dr. Douglas Avison and Dr. Choi spoke on the opportunities for post-graduate experience to be gained in Japan, China and Korea, particularly in the latter country.

MANITOBA

The fine new addition to St. Joseph's Hospital, Winnipeg, containing approximately one hundred beds was opened on January 22nd. This hospital is situated in the north end at the corner of Salter Street and Pritchard Avenue and serves the needs of a thickly populated area. The addition to Grace Maternity Hospital which will contain four labour rooms and an operating room will be opened shortly.

Dr. B. J. Brandson and Dr. J. D. Adamson represented the medical faculty of the University of Manitoba at a meeting of the Association of American Medical Colleges held recently at Chicago. Dr. Adamson later attended the meeting of the American College of Physicians at Cleveland.

Dr. W. L. Mann has been appointed to the indoor staff of surgeons of the Winnipeg General Hospital.

The winning rinks in the Medical Bonspiel held February 16th and 17th, were: Winners of Harvey Smith Tankard: Drs. W. C. Handford, D. Wallace, G. M. Little, W. W. Musgrove. Winners of Consolation Prize: Finals will be played between rinks skippered by Boyd McTavish and J. A. Pullar. There were sixty-four entries in all for the bonspiel.

The new club rooms of the Medical Arts Club in the Medical Arts Building were opened on February 24th.

Dr. J. A. Gunn has resigned as Chief of Surgery in St. Boniface Hospital and has been succeeded by Dr. Gordon Fahrni.

Dr. G. M. Little, Man. '21 of Viking, Alta., is taking post-graduate work in Winnipeg.

Dr. W. F. Dey addressed the Scientific Club on February 15th, his subject being "Ojibway folklore."

ROSS MITCHELL

SASKATCHEWAN

The fifteen year old son of Dr. A. H. Singleton, of Rouleau, was fatally injured in a fire in the hotel in Milestone, while visiting there with the hockey team. We extend to Dr. Singleton and family the sincere sympathy of the whole profession.

Dr. Joseph Hollenberg has opened up an office at Melville.

Dr. N. Hjalmarsson has started to practise at Churchbridge.

Dr. A. L. Portnuff, has taken over the practice of Dr. J. D. Fieldman of Yorkton.

Dr. O. L. Taylor, a graduate of Toronto is now practising at Mortlach.

Dr. P. E. Lavoie has opened up an office at Ponteix.

The City of Saskatoon has voted the sum of $200.00 to be used for an extension to the Municipal Hospital.

Dr. Malcolm Ross Bow, who for several years has been superintendent of the Regina General Hospital, also medical health officer of the City of Regina, has been appointed Deputy Minister of Public Health in the Province of Alberta, succeeding Dr. Laidlaw, recently deceased. While in Saskatchewan, Dr. Bow not only proved himself a valuable member of the profession, but was a most genial companion and endeared himself to all who knew him. We extend to Dr. Bow our sincere and hearty congratulations and wish him every success in his new field.

The regular monthly meeting of the Regina and District Medical Society was held on February 2nd. There were forty-five members present. The meeting was held in the Hotel Champlain, dinner being served at 6.15 p.m. Dr. C. E. Tran, M.L.A., Kamsack, Dr. Reginald Stipe, M.L.A., Watrous, Dr. J. F. Creighton, M.L.A., Estevan, were present as guests of this society. The above doctors together with Dr. G. W. Sahlmark, M.L.A., who is a member of the Regina Society, are attending the present session of the Saskatchewan Legislature. Dr. O. E. Rothwell, gave a very enlightening talk on the Drugless Healers' Act, and the proposed amendments thereto.

Dr. R. McAllister gave a paper on "Carcinoma of the uterus." Discussion led by Dr. J. V. Connell. Dr. J. W. Wright gave an excellent paper on "High blood pressure."

Dr. E. E. Kells and Dr. A. N. Hardy are at present in Vienna doing post-graduate work.

Dr. E. P. Alport left February 1st on an extended trip for post-graduate work in Europe.

Dr. J. W. Turnbull has left Regina to practice in Cleveland, Ohio.

Dr. Urban Gareau has returned from his honeymoon. His wife was formerly Miss Irene Forsyth of Sintaluta.

ALBERTA

Dr. G. B. Mills, who formerly practised at Czar, Alberta, has removed to Senlac, Saskatchewan.

Dr. P. S. Brown of Drumheller is at present in Chicago engaged in post-graduate work.

Dr. W. J. Hanna, until recently practising in Edmonton, has accepted a mine contract at Mercoal on the Coal Branch west of Edmonton.

Dr. M. J. Brayton has returned to Gadsby, having spent some months in post-graduate work at the People's Hospital, Akron, Ohio.

Dr. Madge Onhauser, a graduate of Manitoba University in 1925, is now specializing in diseases of women and children in Calgary, after having served a year's interneship in a women's hospital in California.

We are pleased to note that Dr. F. W. Stockton of Calgary has so far recovered from a protracted illness as to have been able to leave the hospital.

Dr. L. C. Chadsey of Exshaw was recently married to Miss Goodison of the Calgary Public Schools' Staff.

The annual banquet of the Calgary Medical Society was held on February 1st in the Hudson's Bay Company's Elizabethan dining rooms, and was presided over by Dr. R. O'Callaghan. Among the guests were His Honour Lieutenant-Governor William Egbert, a former president of this society; Dr. F. A. Keillor, representing the Edmonton Academy of Medicine; Dr. F. A. Fish, representing the Medicine Hat Medical Society; and Dr. J. E. Lovering, of the Lethbridge Medical Society.

Dr. William Hackney of Calgary has returned from a visit to Chicago where he spent some time in eye, ear, nose and throat work.

Dr. W. G. Saunders, a graduate of Alberta University in 1925, is now practising in Sedgwick, where a vacancy was left owing to the death of Dr. A. E. Wickens.

Drs. Gordon L. McGuffin and J. M. Adams of Calgary have formed a partnership. Both of these physicians have been specializing in diseases of the eye, ear, nose and throat.

Dr. L. R. Bow, of the City Health Department, Regina, has been appointed Deputy-Minister of Health for Alberta in succession to the late Dr. W. E. Laidlaw.

The Council of the College of Physicians and Surgeons recently received a circular from the British Medical Association announcing the Catherine Bishop Harman prize for the encouragement of research into the disorders incident to maternity. The prize will be given every two years and will be the net annual income for two years from £1,000 and is open to any registered physician in the British Empire.

A recent court decision in this province is of interest to the medical profession. The action arose over the question as to who was responsible to the anæsthetist for his fees, since he claimed that the surgeon who requested him to give the anæsthetic assumed the financial responsibility whether he received the amount from the patient or not, so that he looked to him for payment.

Judge Boyle of the Supreme Court of Alberta, ruled that: "The question is whether or not the defendant ever in law or by contract made himself primarily liable for the payment of the fees of the other doctor when he called him in to administer an anæsthetic or for a consultation. The evidence convinces me that there was no definite arrangement made between the two physicians in that respect but that the custom has been over a period of years between them, that the surgeon, as he received money from his patients for the services rendered by the anæsthetist, paid the money over to him. It seems to me that in the absence of proof of a custom, the onus of such proof in my opinion being on the plaintiff, that I must hold that where a doctor calls in another physician to assist him in rendering services to the patient that he does it on an implied request by the patient, and the doctor who renders those services can sue the patient directly for the money and in the absence of any agreement to the contrary and any custom, which has not been proven to me, the law is that the doctor is not primarily liable for those fees, that the patient is primarily liable. Taking this view it seems to me that the plaintiff must fail in his claim for the reasons mentioned."

G. E. LEARMONTH

BRITISH COLUMBIA

A meeting of the full Executive Committee of the British Columbia Medical Association was held in Vancouver on January 30th. Many important matters of an economic nature were dealt with, and seventeen new members elected to the association.

Plans are now well in hand for the summer school of the Vancouver Medical Association. This important part of the society's work is, we need not say, deserving of the interest and whole-hearted support of every member of the profession in British Columbia. No persuasion should be needed to secure attendance. This co-operative means of bringing to our door at a cost which is ridiculously small, some of the best exponents of the science and art of medicine should appeal without further comment. The committee in charge this year has started the work both early and vigorously and a great deal has already been accomplished. The speakers who so far have been secured are: Dr. B. P. Watson, formerly of Toronto and Edinburgh, now Professor of Gynæcology, Columbia University and at the Sloane Hospital, New York; Dr. Clarence L. Starr, Dr. John Oille and Dr. J. G. Fitzgerald, of Toronto; and Dr. Herbert C. Moffitt of San Francisco. We hope in the next issue of this *Journal* to be able to print more particulars with regard to the actual programme which will be presented. Meantime we would ask all doctors in British Columbia to make mental and actual note of the date of this meeting. June 21st to 24th inclusive and to reserve these dates.

On January 29th the new Infectious Diseases Hospital adjacent to the Vancouver General Hospital, was formally opened. Almost immediately the adjacent

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property owners brought suit against the city, asking for an injunction restraining the use of the hospital for infectious cases on the ground that it would seriously depreciate the value of property in its immediate neighbourhood. After two days' hearing the court reserved judgment.

While in Vancouver, in connection with the recent customs enquiry, Mr. R. L. Calder, K.C., gave an interesting and amusing address at a joint luncheon meeting of the British Columbia and Vancouver Medical Associations. His subject was "Murder and medicine," and under this heading he outlined the medical points in various celebrated murder cases in which he had been engaged. Over one hundred medical men attended this luncheon.

At the general meeting of the Vancouver Medical Association on February 2nd, Dr. J. M. Pearson gave a paper on the "Treatment of hypertension," and Dr. C. S. McKee read a paper on the "Interpretation of findings in blood chemistry."

Tentative plans have been prepared for the new maternity and private ward wings of the Vancouver General Hospital, the building of which was provided for by the passage of a Money By-law last December. When these wards are built the fire hazard, which has been a considerable cause of anxiety to the hospital authorities, will be eliminated.

A small group of Vancouver doctors is leaving by the Mauretania on February 21st from New York for a short post-graduate tour. Drs. W. E. Ainley, F. W. Brydone-Jack, T. H. Lennie and H. A. Spohn expect to take an intensive course in Vienna, afterwards proceeding to London and returning to Vancouver about the middle of June.

Dr. F. C. Dunlop has gone east for post-graduate work and afterwards intends paying a visit to his old home in Ireland. He will also do post-graduate work in England.

The Victoria Medical Society listened with great interest to a paper on "Fractures and their treatment," by Dr. E. L. Garner, of Duncan. The lecture was illustrated with lantern slides and Dr. Garner was also able to show a number of patients with results of special treatment and demonstrated a large collection of splints and appliances which he used in this work. Those present will long remember the instruction given and their gratitude to Dr. Garner was evidenced in an enthusiastic vote of thanks and long continued applause.

We are pleased to report that Dr. A. W. Montague, of Victoria, has recovered from an operation for appendicitis.

The November clinic meeting at the Royal Jubilee Hospital, Victoria, was well attended and most interesting cases and other clinical material comprised an instructive evening.

Dr. W. Allan Fraser, of Victoria, son of the late Dr. R. L. Fraser, was married on December 18th, in San Francisco, to Miss Laura Margaret Eng, of Victoria.

Dr. Stuart G. Kenning of Victoria, has recently returned from eastern centres where he spent some time doing post-graduate work.

Dr. A. S. Underhill, of Vancouver, left on January 17th to relieve Dr. J. H. Carson at the Premier Gold Mine, for three or four months.

Dr. H. C. Wrinch, M.L.A., of Hazelton, was detained in the Vancouver General Hospital for a few days with an infected leg, whilst on his way to attend parliament in Victoria.

Recent visitors to Vancouver included Dr. H. H. Murphy, of Kamloops, Dr. M. W. Thomas, Victoria, and Dr. W. A. Coghlin, Trail, Dr. C. H. Hankinson of Smithers.

Dr. W. C. G. Bissett has relinquished his practice at Cassidy, B.C., and is now at Trail, B.C.

Dr. A. E. Trites, who has been assisting Dr. H. B. Maxwell, of Ladysmith for some months, has been appointed medical officer at Cassidy, vice Dr. Bissett.

Dr. Geo. More, late of Nanaimo, is now assisting Dr. Maxwell of Ladysmith.

UNITED STATES

One Hundred Thousand Dollars for Conquest of Cancer

At a dinner given by President Nicholas Murray Butler of Columbia and the Hon. Charles Evans Hughes, in the interest of the American Society for the Control of Cancer, December 15th, it was announced that Mr. William L. Saunders, New York, had offered a reward of $100,000 for discoveries of the causation, prevention and cure of cancer. The decision on which the awards will be made is to be reached by the American Society for the Control of Cancer, and approved by the American Medical Association and the American College of Surgeons. The offer has not yet been formally accepted. Information as to how persons who wish to present their discoveries for consideration should proceed will be announced later. Mr. Saunders is chairman of the board of directors of the Ingersoll-Rand Company, director of the Federal Reserve Bank of New York and president of the United Engineering Company. The offer stands for three years from December 15, 1926, and probably will then be renewed, if necessary. Fifty thousand dollars will be given to any person or group who may discover what human cancer is or how it can be positively prevented, and a like sum to any person or group who may discover an absolute cure for human cancer, or the entire $100,000 may be given to the same person or group.

Attention is drawn to the fact that it is proposed to raise sufficient funds to endow a home for physicians who on account of advanced age, physical and mental disability or misfortune, are no longer able to provide for themselves and their families. The home we understand is to be chiefly for physicians of the six New England States. We note that it has received the endorsement of the American Medical Association, and we sincerely wish the project much success.

That the wave of influenza that has been sweeping over Europe is settling down before it touches our shores is the conclusion reached by officials of the United

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Division of Tropical Medicine and Hygiene (University of London), 23 Endsleigh Gardens, Euston Road, London, W.C.1. Two Courses yearly, each of 20 weeks, commencing on March 14th, 1927, and October 3rd, 1927. For Prospectus and Calendar apply to the Secretary of the School, at the above address.

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When in Toronto visit the ROYAL ONTARIO MUSEUM, 253 Bloor Street West, near Avenue Road. Largest permanent exhibition in Canada. Archæology, Geology, Mineralogy, Palæontology, Zoology. Open daily—10 a.m. to 5 p.m. Sunday—2 to 5 p.m. Bloor, Bay and Church cars.

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States Public Health Service based upon failure to receive further information on the progress of the epidemic.

An anti-evolution bill was introduced in the Missouri legislature on January 18th. The proposed law would prevent "the teaching of any theory or hypothesis in regard to the origin of life on this planet in the public schools that is contradictory of the divine account of creation as set forth in the first and second chapters of Genesis in the Holy Bible."

A resolution which would have prohibited the teaching of evolution in West Virginia's public schools was defeated in the house of delegates on January 21st.

An extended investigation is being carried on by Dr. Frederick L. Hoffman, consulting statistician of the Prudential Insurance Company, who has the co-operation of fifteen American and Canadian cities and three Canadian provinces. The investigation includes attention to living cancer patients, of which some 3,000 have been reported upon. Among other facts disclosed is the apparent increase in cancer of the lungs. As a general rule, cancer and tuberculosis rarely coincide in the same person. Dr. Hoffman's Canadian investigations show that French Canadians have a much lower cancer death rate than English Canadians. As yet, no satisfactory explanation for the difference has been forthcoming. Cancer of the lip and mouth is apparently more common among French Canadians in Montreal than among the remainder of the population, but cancer of the esophagus and gall bladder is less common. Cancer of female organs is also decidedly more infrequent among French Canadians than among other Canadians in Montreal. The investigation is being extended to other sections of Canada as far as the Pacific coast. (*Science*, February 4, 1927.)

When either measles or whooping cough make their appearance in a German family an attempt is made to prevent those diseases or to forestall serious complications by inoculating the exposed children with blood from their parents. Professor Rudolf Degkwitz, who is director of the children's clinic at the University of Greifswald in Germany and is engaged at present in research on measles at the United States Public Health Service, considers this practice of value.

In the densely populated countries of Europe, he explains the chances of reaching full-grown manhood or womanhood without contracting measles or whooping cough are very small. To obtain the best results it should be administered the first day of the disease, when the temperature begins to rise. Administered at this time it modifies the disease to a very mild form. British health authorities maintain that up to the present the reports of this practice have not shown satisfactory results. (*Science*, February 4, 1927.)

Book Reviews

Operative Surgery. Catechism Series. Part, I, II, III. C. R. Whittaker, F.R.C.S., F.R.S.E. Fourth edition. 216 pages, 57 illustrations. Price 50c. each part. Macmillan Co. of Canada, Toronto, 1926.

This catechism series of three small volumes on operative surgery is what its title implies, a compilation of questions and answers. The fact that it is now in the fourth edition points to its fulfilling a place in surgical education. Its field of usefulness would appear to be in assisting the student to pass a purely theoretical examination. The arrangement of the contents is in good order, and each subject is dealt with concisely.

R. V. B. SHIER

Plastic Surgery of the Head, Face and Neck. H. Lyons Hunt, M.D., L.R.C.S. 404 pages, 342 engravings and 10 coloured plates. Price $7.00. Lea & Febiger, Philadelphia and New York, 1926.

In this well presented monograph, Dr. Hunt points out that plastic surgery is no new art, harking back as it does some two thousand years to the knowledge of the Hindoos and their use of pedunculated flaps and skin grafts. At the same time he comments on the fact that only since the World War has the interest in this particular branch been sufficiently keen to widen the scope of plastic work, and to bring out new methods and new operations.

The author has presented his subject concisely, yet with no sacrifice of thoroughness, and a special word should be said about his use of English. He writes excellent English and has an attractive style. The subject matter begins with an excellent chapter on the history of plastic surgery. Then follows chapters upon the skin, prosthesis, local anæsthesia—all of a general nature. The subjects of grafts and transplants is considered in twenty pages. Then come wounds, keloids, congenital superficial defects, burns, scalp and skull defects, defects in the region of the eye, otoplasty, rhinoplasty, meloplasty, lesions of the jaws, hare lip and cleft palate, defects in the region of the neck, and a final chapter upon physiotherapy. It is obvious that the subject is taken up most completely, and the book is worthy to take its place beside other standard American works on this subject, such as that of Staige Davis and Vilray P. Blair.

The illustrations are numerous and satisfactory. A welcome feature is the attention paid to the anatomy underlying the various operations described. The author gives due credit where credit is due, especially to the moderns, English, American and European, but at the same time is able to speak with the authority of personal experience.

The chapter on keloids is especially interesting. This obstinate malady has called forth a great variety of forms of treatment, which the author discusses, his conclusion being that success is rarely attained by any of them. He proposes a new treatment, based on a study of the pathology of keloids. He had already demonstrated the value of turtle bile in the prevention of scar tissue formation, and his procedure, which has given him excellent results, is first to excise the keloid, suture with a subcutaneous stitch, and then apply the turtle bile. After healing, x-rays are used. The combination of all three factors has given him a marked freedom from recurrence.

The chapter on cleft palate, in the reviewer's opinion, is perhaps the least satisfactory. The author seems to prefer the Lane operation, and says it is now most generally employed in dealing with palate defects, but with this conclusion we are inclined to disagree, and certainly the profession still lacks from Mr. Lane any proper presentation of his results. The Brophy operation is described, and here, too, we think general opinion is not favourable; but we miss any decided opinion from the author with regard to these various operations.

One can not go further into detail in a review. Suffice it to say that the author has done his work in a scientific way, with a pleasant style; and the

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addition to each chapter of a reasonable list of bibliographical references, well chosen, is valuable.

E. W. ARCHIBALD

Physiology and Biochemistry in Modern Medicine. J. J. R. Macleod, M.B., LL.D., and others. Fifth edition. 1054 pages, 291 illustrations. Price $11.00. C. V. Mosby Co., St. Louis. McAinsh & Co., Toronto, 1926.

In his famous book *Introduction a l'etude de la médécine expérimentale,* Claude Bernard, one of the greatest physiologists of all times and an unsurpassed master of experiment, expressed the view that an experiment is nothing more than an "arguing" (*raisonnement*). An experiment is a mental process accomplished with the thoughts and in the thoughts, but not with the hands. An experimenter receives certain impressions from the phenomena which he is watching. To explain these phenomena the physiologist is constructing a theoretical purely imaginary scheme of the events which probably occur in the body, and to which are due the phenomena observed. In other words he makes a supposition about a possible mechanism of the phenomenon in question. Now comes the proper manipulation, commonly known as an experiment. The changes which occur as a result of experimental interference, serve as a basis for accepting or rejecting the hypothetical supposition. Usually an investigator is using only indirect indications concerning the changes of certain functions, because he is not able to see what really occurs in the body during the experimentation.

This point of view on the experiment may with full right be applied to medicine, especially to the diagnosis of diseases. A medical man receives certain impressions observing the abnormal phenomena in a patient. To decide what are the causes of the phenomena, the doctor is performing an experiment. He is constructing an "ideal scheme" determined by certain laws. In this scheme, of course purely imaginary, he tries to include the observed pathological phenomena, and to explain them. Very often the diagnosis is an experiment in the commensense of the word, but even when a doctor does not manipulate, he is still experimenting, because an experiment is first of all a mental process.

From this point of view the value of physiology lies not only in the data with which it is supplying the student, but also in the training of his mind in "physiological thinking." The physiological data form a basis of the medical science, and the physiological, in other words, experimental mode of arguing, gives to a medical man the tools of his everyday work.

Approaching J. J. R. Macleod's *Physiology and Biochemistry in Modern Medicine* with these thoughts, one may see that the author has chosen one of the most interesting and important problems. He has fulfilled his task with great skill. He has shown clearly that the physiological data, which seem for many of our profession to be so far from everyday practice, form a real basis of scientific medicine. Almost each chapter of physiology finds its reflection in the corresponding pathological discussions. Especially interesting are the chapters concerning respiration and metabolism. The chapters dealing with the "Physicochemical basis of physiological processess" are written with a remarkable lucidity. In the new 5th edition a new section on the "Physiology of the special senses" has been added, and the chapter on the "Neuro-muscular system" has been expanded. This makes it possible to use Macleod's book as a text-book for students.

Besides this, each page of the work teaches the reader to think "physiologically", and how to apply this method of arguing to far more complicated pathological problems. Thus the book helps a thinking medical man to replace an unconscious, by a conscious mental process, and to substitute an empirical knowledge with a true scientific investigation.

On account of all this, the work may be looked on as a real masterpiece. Not only will students of medicine find in it a sure guide in physiology, but every practitioner will do well to place this book in his library as an indispensable advisor in his work.

B. P. BABKIN

Common Procedures in the Practice of Pædiatrics. Alan Brown, M.D., Associate Professor of Medicine in charge of Pædiatrics, and Frederick F. Tisdall, M.D. 260 pages. Price $4.00. McClelland & Stewart, Toronto, 1927.

The scope of this book as outlined in the preface is to present to the physician an adequately detailed description of the common procedures employed in the medical service of the Hospital for Sick Children in Toronto. To ensure that the book should be of a size convenient for use, only those methods have been described which have proved to be of practical value, but a careful inspection enables us to state that all the actual steps, and necessary apparatus for the various clinical measures which may be called for in attending upon a sick child, are described with a detail which should prevent any difficulty arising. The book in this way covers ground not covered by any other with which we are acquainted, and may be heartily commended to the profession as an excellent text-book of pædiatric methods, thus filling a very definite space among the most useful books on the physician's table. To hospital internes and to senior students it will prove invaluable. The rules for history taking and the physical examination of infants are particularly good; the normal is concisely described and all abnormalities for which the physician should be on the watch are noted. The chapter on infant feeding presents the modern views and adds directions for a few of the more important special problems. The chapter on the pre-school child is well written; both the nervous and the undernourished type receive detailed notice especially during the age of adolescence. The use of biological products in the diagnosis and treatment of communicable diseases is compact and comprehensive. A special chapter is devoted to difficulties in diagnosis, and space is given to the diagnosis and treatment of several obscure diseases of infancy. Laboratory methods in common use in the treatment of children are adequately covered.

The book as a whole is very readable, well arranged and printed; no procedures are detailed which have not already been proven trustworthy and useful in practice. The work should do much to improve the practice of pædiatrics among those who have not had opportunity for special training in a hospital for children.

R. R. STRUTHERS

Shell Shock and its Aftermath. Norman Fenton, Ph.D., Associate Professor of Psychology, Ohio University, with an introduction by Dr. Thos. W. Salmon, Professor of Psychiatry, Columbia University. 173 pages, illustrated. Price $3.50. St. Louis, C. V. Mosby Co. McAinsh & Co., Toronto, 1926.

Looking at the title on the back of this book—"Shell Shock" one would very likely pass it by as being of little interest at this date when the great flood of writing on the psychiatric disabilities of the war has largely subsided. The really important and enticing part of the title is found inside on the title page. There one learns that the "Aftermath" of shell shock is to have consideration.

Many too, would be deterred from reading the volume by noting that its author is a Ph.D.—a psychologist. In this country there are few so-called clinical psychologists and the first question (likely to be a fatal one as far as reading the book is concerned) is sure to

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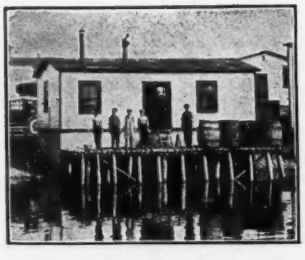

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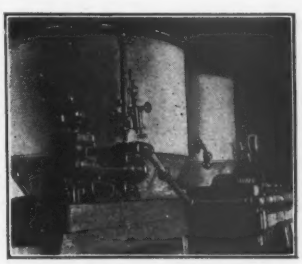

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be "What is a man of such qualifications likely to know of shell shock? Those to whom this question will occur may safely be reassured for Dr. Fenton is a psychologist who saw service in the chief American Neuro-Psychiatric Hospital in France and who has among his qualifications a well developed psychiatric outlook.

The book really has little to say on the clinical aspects of war neurosis, it is, however, a valuable social study—an attempt to elucidate the etiology and to appraise the results of the various means adopted to help the victims of this particular form of disability.

A number of the chapters, dealing as they do with matters of organization in the medical service of the American Expeditionary Force will have interest only for former members of that service and for medical men deeply interested in the problems of military medicine. The remainder of the book will greatly interest psychiatrists and all physicians whose work brings them into contact with large numbers of so-called "neurotic" patients.

In the matter of etiology, the author carries out a painstaking survey of mental and physical makeup, social and economic background and military career of a large series of cases admitted to Base Hospital No. 117—the chief Neuro-Psychiatric Hospital of the A.E.F. His conclusions do not differ greatly from those of other authors. His discussion of various mechanisms that may be at work in the production of a neurosis is short but gives fair representation to all theories so far advanced.

The most valuable part of the book is the portion telling of the results of re-investigation of the condition, individual and social, of the former patients of Base Hospital 117. A determined effort was made to establish contacts with these men and a large number were actually reached. The first survey undertaken in 1919-1920 showed 38.2 per cent "normal"; 1 per cent definitely psychotic; the remainder still showed in greater or less degree the evidences of their neurosis. A total of 60.9 per cent were able to "carry on." In the survey of 1924-1925, this figure had increased to 80.8 per cent. The improvement indicated he believes to be in part due to the *vis medicatrix naturæ*, in part to the improved industrial condition, and in a very large part to the work of the United States Veterans' Bureau and other social organizations dealing with war neurotics.

Dr. Fenton in conclusion expresses the hope that in future the baffling problems of psychoneuroses may be met not by "mere payment of pensions, or mere neglect and derision or all the false and weak attitudes of extreme sympathy" but by a further extension of what might be styled "a sort of supervocational guidance" taking careful account of the three factors: functional, occupational and social.

The chief value of the book will be as a carefully checked piece of medico social investigation, interesting and thought provoking to all those whose work brings them into contact with "neurotics" of the "war" or any other type. A. T. MATHERS

Pneumoconiosis (Silicosis). A Roentgenological study with notes on pathology. Henry K. Pancoast, M.D., and Eugene P. Pendergrass, M.D. 186 pages, 23 illustrations. Price $4.00. Paul B. Hoeber, New York, 1926.

This is a presentation in book form of an article reviewing the subject of pneumoconiosis which appeared in *The American Journal of Roentgenology and Radium Therapy* for November, 1925. It has been expanded and there is a presentation in abstract of current views of the pathology of the disease. Silicosis either alone in its advanced stages, or more usually combined with tuberculosis has been recognized for years in various industries and has been given such names as miners' phthisis and grinders' rot. Pneumoconiosis as a general term includes the dust pneumonias or pulmonary fibrosis from various dusts. Anthracosis (coal), siderosis (iron), chalicosis (pottery), indicate the specific industries with which the condition has been associated. In Great Britain and her Dominions there has been very extensive study of the condition as found in hard rock miners, and particularly in the gold mining industry of South Africa and Australia where the term silicosis is in general use. This terminology indicates that the silica of the rock is the principal factor in the causation of the fibrosis. The authors of this book are inclined to consider silica as the only important cause of pneumoconiosis, and that the anthrocosis of the coal miner is in reality a silicosis with the added deposition of relatively harmless coal dust. It is pointed out that the roentgenological examination is the easiest and most reliable method of studying the effects of dust inhalation in the living subject. The inhalation of silica dust within the alveoli appears to stimulate the proliferation of certain cells, probably from the endothelium of the capillaries and lymphatics, which become wandering phagocytes and take up the dust particles. Riddell in a recent article in this *Journal* states he found them in the alveoli, in the interalveolar tissue, in the pleura and the liver. These "dust cells" are transported through the lymphatics. If the lymphatics become choked by a continued dust inhalation fibrosis ensues, stasis follows and a progressive fibrosis results. It is believed by some that the finely divided silica becomes a hydrated colloidal silica which acts as a cell poison. A connective tissue cellular proliferation results.

The authors have had a wide experience in the study of stereoscopic films of the chests of men employed in various dusty occupations and give splendid descriptions of the radiographic findings in the various stages of the condition. The book is a most valuable monograph on the subject and will interest all teachers of medicine, all internists and particularly physicians who have to deal with industrial medicine in dusty occupations. With the development of mining in Canada this industrial disease is on the increase and is now on the list of diseases for which compensation is granted. This monograph will be of great assistance to those who are called upon in question of diagnosis. Prevention is discussed but not in detail. Perhaps the most important feature of the disease is the fact that if recognized early its progress may be stayed by removal of the employee from his dusty surroundings and its crippling effects avoided. Its early recognition will be facilitated by this excellent presentation of the subject. J. H. ELLIOTT

Infections of the Hand. Lionel R. Fifield, F.R.C.S. 192 pages, 67 illustrations. Price 9/- net. H. K. Lewis & Co., Ltd., London, W.C.1, 1926.

This is a timely book and answers well the purpose for which it is written. Experience in industrial as well as in war surgery, would indicate that a book such as this is needed.

Our present knowledge regarding infections of the hand is clearly stated. A careful perusal of the chapter on anatomy fully explains the reasons why punctured wounds of the creases of the phalanges are so liable to be followed by primary thecal whitlow. The description of the lymphatic vessels of the upper extremity will well repay the time spent in their study.

Among workmen, especially those who from the nature of their occupation are prone to infections of the fingers, such as whitlow, the treatment of which from an industrial standpoint is important, is well discussed by the author in Chapter II, and surgeons who do much minor surgery will find this chapter full of interest to them. In dealing with the complications of whitlow, the writer emphasizes an important fact frequently overlooked; when the distal interphalangeal joint is involved and an amputation through the

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middle phalanx has to be performed adequate skin-flaps are often unobtainable. Amputation through the proximal joint in these cases may be necessary. In this case it is essential to suture the flexor to the extensor tendon over the end of the phalanx, thus perserving the power of flexion in the metacarpo-phalangeal joint.

The complications of palmar infections are discussed in detail and the signs and symptoms and also the treatment clearly presented.

In my opinion the chapter on lymphatic infections of the hand alone is well worth the price of the book. The author very forcibly calls attention to the fact that lymphangitis from an infective focus of the thumb, index or middle finger may be much more serious than one of the ring or little fingers. Many of us know this, but we also readily forget it. The book is well illustrated and will prove valuable to the industrial surgeon, general practitioner, house-surgeon and student.

G. G. CORBET

Practical Surgery of the Joseph Price Hospital. James William Kennedy, M.D., F.A.C.S., Surgeon to the Joseph Price Hospital. 847 pages. 129 illustrations. Price $11.00 net. F. A. Davis Co., Philadelphia, 1926.

This book purports to teach certain surgical principles which are claimed to be either unknown to or neglected by the writers of modern text-books of surgery. The author essays this task partly as a tribute to his beloved master, Joseph Price, and partly because he feels keenly the need for the wider teaching of the principles he outlines in this volume.

The reader will discover on opening the book that the author takes up a position in regard to surgical pathology and treatment quite different from the orthodox one. For instance in appendicitis he says that there is never a stage of the disease when the operation may be delayed with advantage even for one hour. He recommends the use of ungloved hands in abdominal operations, and he thinks that the Fowler position for patients suffering from peritonitis is a bad one. For drains he uses gauze, and in certain cases he packs it into the pelvis in large quantities. Silk is his suture material and catgut is condemned. The abdominal wall he sutures in one layer with silkworm gut. Murphy's button is preferred to suture for intestinal anastomosis.

From these examples it will be seen how unorthodox are the principles advocated, and the arguments in favour of their adoption are the author's impressions of the results of the surgical treatment at the Joseph Price Hospital. No statistics are given in accurate numbers.

The usefulness of the book to the student is not then apparent, but those men who have already served their surgical apprenticeship may perhaps profit by several practical points. Thus the insistence upon the paramount importance of symptoms and signs in the making of a diagnosis is refreshing, and the relegation to their proper place of the "dossier" of pathological reports is useful as a corrective to a too prevalent modern tendency.

The author indicates that judgment must be given the supreme place in the surgeon's mind, and he emphasizes the vital necessity for continued effort to improve this quality by the following up of patients after operation, and the study of results.

The book is in no sense an attempt to cover any part of surgery systematically: it is rather a disjointed discussion of those subjects to which the author feels that the principles of his old teacher are applicable. The reading of the text is made difficult and the pages are greatly marred by the mutilation of the English language in paragraph after paragraph. For instance, "There is certainly no combination of operations I do which has the great per cent. of success as that of vaginal hysterectomy by the clamp method." Page 335.

The author appears to expect criticism of his teachings, and this he surely must have when he preaches doctrines so reactionary without the evidence to support them which discriminating surgeons demand.

W. E. M. MITCHELL

International Clinics. Edited by Henry W. Cattell, A.M., M.D., and others. 308 pages, 88 illustrations. Vol. iv, 36th Series. Price $2.50 for one volume, $10.00 for the set of four. The J. B. Lippincott Co., Montreal, 1926.

The fourth volume of the thirty-sixth series of these clinics is divided into sections on diagnosis and treatment; medicine; surgery; and a report of the Cleveland meeting of the 1926 Interstate Post-Graduate Assembly of North America. This last is by Dr. H. W. Cattell, and comments on the remarkable development of the original Tri-State Medical Society into the present association which aims at providing post-graduate instruction for the whole of North America. He looks forward to a time (if the present manner of development be kept up) when not only South America, but Europe, and eventually the whole world will be embraced in one comprehensive association of this nature.

We notice papers by Dr. W. R. Campbell of Toronto on "Acidosis coma and infection in diabetes mellitus," and by Dr. Marlow, also of Toronto, on "Pelvic infection," and there are several papers by continental workers.

H. E. MACDERMOT

Accidental Rashes in Varicella.—Ugo de Gironcoli (*Riv. di Clin. Ped.*, September, 1926, p. 623) reviews the literature, including the paper by J. D. Rolleston (*Journal*, 1907, i, p. 1051), on accidental rashes in varicella, and records two illustrative cases. The transient erythema which may precede or accompany the eruption of varicella is regarded by some as so uncommon that in several text-books it is not even mentioned. The rash, which is scarlatiniform in six-sevenths of the cases, and may therefore give rise to errors of diagnosis, is characterized by its sudden appearance and localization on the trunk and proximal ends of the limbs, by the fact that the subjacent skin is pale and not yellowish as in scarlet fever, by its rapid disappearance, though it may persist for five or six days, and by the absence of pruritus and subsequent desquamation. The eruption is generally regarded as a toxic erythema induced by paralysis of the capilaries in the cutaneous area which is already affected by various influences usually endogenous in origin. The author's two patients were brothers aged seven months, the subjects of congenital syphilis, in whom a scarlatiniform eruption appeared on the second and third days of varicella respectively and faded without being followed by any desquamation or albuminuria.